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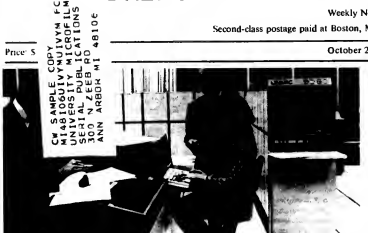

The Univac 90/60 medium-scale system is said to provide 1.6 times the processor power of the IBM 370/135. The CPU includes a maintenance panel that has a microfiche projection system used to display the status of all key operations.

Multi-Purpose Univac 90 Takes Aim at 370 Users

By Michael Weinstein
Of the CW Staff

NEW YORK – Univac has introduced a medium-scale mainframe, the 90/60, designed for a broad range of applications including high-speed computation, batch processing and remote job entry in concurrent combinations.

Beyond this, the 90/60 is the first of a new family of computers designed to eventually bring Univac users into one series with similar architecture. It is intended, Univac said, to fight for a portion of the potential 10,000 IBM 370/135 users by offering a computer that is reportedly as much as 16% cheaper in some configurations and 60% faster across the board than the 135.

Justification for the 60% faster assertion comes from tests Univac ran on both the 90/60 and 370/135 using a standard instruction mix. The mix chosen is the same instruction set used by IBM for comparative analysis within its own product line, a spokesman said.

Internally, the 90/60 fills the gap between the 9400 and 9700 Series to provide a full range of systems evenly spaced with logical upgrade gaps. It is also designed to enable RCA users to join the mainstream of Univac systems.

Standard for Univac

In these roles, the 90/60 is the first of a new series that will eventually become the basic Univac product line. Thus, users can expect the architecture and approach taken in the 90/60 to become standard to future Univac computers.

The 90/70, released as the second machine in the new family, is essentially a redesignation of the 9700 with semiconductor storage.

The 90/60 central processor operates under microprogram control using a writable control store and contains an interval timer, storage protection register stacks, multiplexer, a selector channel and floating-point arithmetic.

By using microprograms to implement instructions – instead of hardwired logic – the CPU provides emulation capabilities for most 360 and 1400 Series computers, a spokesman said. Emulators are also available for the Series 70 and RCA 301 systems.

The processor register stack contains 16 registers for supervisory functions, 16 registers for user program functions and four registers for floating-point operations.

The system console consists of a keyboard and a video display unit which displays all communications between the operator and operating system. A console printer is optional.

A maintenance panel on the 90/60 uses a microfiche projection system to display the status of all "key positions," the company said.

Main storage for the system is built around a semiconductor memory with a cycle speed of 600 nsec for each four-byte word access. Storage capacity begins at 131K bytes and can be expanded to a total of 524K bytes. The expansion is accomplished in 32K-byte increments to 262K bytes, then in 65K-byte increments to 393K bytes, and finally in a 131K-byte increment to the maximum of 524K bytes.

One selector channel is included in the basic system configuration and two selector channels are optional. Eight standard control units may be attached to each selector channel. Up to 16 I/O devices can be attached to each of the eight control units depending on the particular subsystem selected.

The processor has one multiplexer channel with eight physical connections to which either standard control units for devices such as a card reader, card punch, line printer or data communications sub-

(Continued on Page 2)

Damage Ruling Set Aside

Telex Cites $ Problems

IBM Army (of Lawyers) Takes Tulsa!

By E. Drake Lundell Jr.
Of the CW Staff

TULSA, Okla. – "Easy Come . . . Easy Go." "That's your headline boys," a jaunty, almost cocky Tom Barr yelled at reporters in the corridors outside the courtroom after Judge A. Sherman Christensen set aside his $352.5 million judgment for Telex last week.

The stickling point was the IBM counterclaim charging that Telex stole IBM trade secrets for which the judge had fined Telex $21.9 million, and the new concept that much of Telex's success was due to those thefts.

A recent but unrelated decision in another court held that a plaintiff could not collect damages on money illegally obtained. And Christensen, using this ruling as a precedent, indicated he wanted to be able to determine how much of Telex's damage claim was based on its theft of IBM trade secrets.

He concluded from the record in the case that this was an impossible determination – and so he set aside the $352.5 million damage claim he had earlier awarded to Telex.

IBM's legal team, generaled by Barr, exuded confidence even though the judge pedagogically reiterated "IBM was guilty of monopolization . . . guilty of attempted monopolization . . . guilty on violations of the Sherman Antitrust Act . . . only the amount of damages are in question."

But from the demeanor of the lawyers representing IBM and Telex, it appeared the real pressure was on Telex, and IBM apparently was enjoying itself.

If the day the original decision in the case was announced had seemed to be Telex's day in court, last week's post-trial hearings were good ones for IBM and its army of lawyers.

Both IBM and its outside attorneys, Cravath, Swaine and Moore rolled in their 1555mm big guns with *the* general, IBM's Board Chairman, Frank T. Cary, in the lead.

Cary – flanked by six of the highest executive lieutenants of the firm – started the week impassive and gum-chewing during the first day, but by the second day after the judge had set aside the damages, he seemed to be living up to his jovial reputation more, even laughing with his lieutenants at some of the points Telex attorneys attempted to make.

The rumor of a negotiated settlement was fueled by Telex's blockbuster announcement that it would go bankrupt if the judge allowed his amended decision to stand.

The judge had opened the possibility that he would either order a new trial strictly on the damage issue of have further hearings in the action in this case, while the rest of the issues were being sent to the appeals court.

Under this formula, Christensen would allow the rest of the suit to go to the appeals court and then on to the Supreme Court without including the amount of damages to be awarded to Telex. They would be determined at the later hearing, either while the appeal hearing was going on or after it had been finished.

But Telex attorney Floyd Walker said the firm was $100 million in debt and $30 million of that was past due. The enforcement of the $21.9 million counterclaim charge would force Telex out of business, he said, if it was not offset with the judgment against IBM on the antitrust action. But, moreover, it is too late for Telex to file an appeal on the $21.9 million judgment, officials noted.

IBM Relents

Then IBM attorney Barr backed off and said IBM management had instructed him to tell the court that IBM would not move to collect on the counterclaim until

(Continued on Page 2)

Chattanooga's Famous 370 Does Job, Amid Confusion

By Michael Weinstein
Of the CW Staff

CHATTANOOGA, Tenn. – Moving through the fog of apparent confusion over a court ruling, this city has installed and started using an IBM 370/145 despite a judge's decision the city could not sign a binding lease agreement for the contested system without open bidding.

Regardless of the judge's ruling, the city argued it had to process on the Model 145 or fall hopelessly behind in staterequired work it could not complete on the presently authorized 360/30.

Once implemented, the 370 made up all back work in about a week, leaving opponents of the system fuming while alleging the city and IBM merely were "crying wolf" to get around the judge's injunction.

The Ruling

In early September two private citizens and branch managers for two non-IBM suppliers filed suit to stop the city from obtaining the IBM system without public bidding.

In his ruling, Chancellor Herschel S. Frank directed the city to show cause why it should not be prevented from fulfilling its latest lease arrangement with IBM. Until such time as the city could justify this no-bid system, the judge ruled it could not sign any agreement for the

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Multi-Purpose Univac 90/60 Aims at 370/135 Users

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system can be attached. The basic multiplexer channel provides for 15 subchannel addresses.

The 90/60 can be equipped with one or more selector switches to let the user switch subsystems or groups of subsystems from a selector channel or multiplexer channel on one processor to the same or another processor.

On-Line Storage

The major on-line storage medium is expected to be either the standard Univac 8440 or 8414 disk subsystems. The 8440 provides a storage capacity of 119M byte/ spindle. The 8414 has a storage capacity of 58M bytes. Both have an average access time of 30 msec and a data transfer rate of 624 kbyte/sec.

As the 90/60 will mostly be used in a multiprogramming environment, programs and data will be swapped to and from the disk subsystem under the direction of the OS/7 operating system.

Software

OS/7 is a multitasking operating system compatible with IBM 360/DOS, a spokesman said.

In its standard version it requires about 65K bytes of main memory resident. From this partition it controls the allocation of the rest of memory using 4K-byte partitions. Thus, a program requiring 33K bytes of main memory would receive nine 4K partitions or a total of 36K bytes.

Job scheduling is based on the recognition of priorities assigned to each job by means of a job control statement. Jobs are scheduled on either a first-in, first-initialized (FIFI) or s first-in first-fir (FIFF) basis.

All data communications operations are executed under control of the Integrated Communications Access Method (icam) operating as a component of the OS/7 system.

Icam supports the Univac DCS-1, DCS-4, DCS-16 and DCS-1C communication systems, the Uniscope 100 display terminal, the 1004/1005 card-processing systems, the Univac 9200, 9300, 9400, 9700 and the IBM 2780 Data Transmission terminal.

Five-year lease price for a typical 90/60 system will be approximately $12,000/mo, including maintenance. Purchase price for this system is around $560,000.

A loaded system under a five-year contract would lease for about $24,500/mo and cost about $1.15 million.

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IBM Musters Impressive Army In Tulsa, Damages May Be Reset

(Continued from Page 1)

all appeals on the matter had been finished unless something came up.

This move was important because if the matter had gone to appeal and IBM had moved to collect those damages, Telex would have had to post a bond for the amount of the counterclaim judgment – and the likelihood of the firm getting such a bond was slight.

The other major action concerned the injunctive relief granted Telex under the initial judgment by Christensen.

IBM argued that the injunction should be either tightened up considerably or thrown out completely, while Telex said they should be strengthened.

Barr argued it was highly unusual for injunctions to be issued in a private antitrust suit and said they should be dropped completely. Failing that, he said they should be tightened up considerably to just those products and practices where the court found IBM had a monopoly or had acted illegally.

IBM committed all its shock troops as Nicholas DeB. Katzenbach, the former law professor and U.S. attorney general argued a large part of IBM's request that the judge set aside the injunction.

One of the top legal minds in the U.S., Katzenbach may well have given the judge pause for consideration when he claimed that even he could not understand what the injunction means.

Katzenbach, not the typical image of an IBM man, with his rumpled demeanor and longish hair below an almost bald dome, had taken no previous active role in the court during the argument in the case and rarely ever argues for his client in court.

Besides the big guns for IBM, many of the major forces in the plug-compatible peripheral industry were well represented at the trial along with a gaggle of security analysts.

Les Kilpatrick, president of Calcomp and the first to file against IBM after the Telex decision was there, along with Bob Lloyd, president of Advanced Memory Systems; Larry Spitters, president of Memorex; and Trude Taylor, president of Electronic Memories and Magnetics, in many cases accompanied by their lawyers.

Floyd Walker, the chief Telex trial attorney, seemed grim and harried under the IBM legal onslaught most of the week as the once-solid relief potential and damage judgments in the case seemed to melt away into confusion.

In fact, Walker's only comment on the Barr statement of "easy come, easy go" was only that "it wasn't even an easy come."

One of the other members of the Telex legal team perhaps expressed it best when he noted, "They sure keep coming and wear you down, don't they?"

Chattanooga's 370 Does Its Job

(Continued from Page 1)

new system.

The chancellor, however, also stated this ruling in no way affected previous agreements for computing equipment with IBM [CW, Oct. 3].

The city and IBM acted on the second part of the ruling snd brought in the contested system, rationalizing their actions as part of previous contracts dating back to the early 1960s.

Arvin Reingold and Joe DiRisio, attorneys for the forces trying to stop the procurement, claimed that the judge's ruling was ambiguous and could permit installation of the new system, it did not provide a means to pay for the $1.45.

They held that any payment plan would naturally entail a new agreement and the judge had specifically prohibited this.

Thus, the city had possession of the new system but did not use it until the middle of September. Around Sept. 16 Howard Lewis, DP manager for the city, publically claimed that the inability to use the 145 jeopardized the printing and distribution of current tax bills before the Oct. 1 deadline.

On Sept. 17, Lewis got permission from city auditor Bill Zachery to start using the new system. Payment would come from existing city funds, he said.

Lawrence Harwood, local NCR branch manager, cried foul, feeling the city's cries of impending disaster were timed to create a rationale for evading the judge's ruling.

The city stated its need for the larger 145 was not "crying wolf."

The State of Tennessee, Lewis said, changed the nature and form of all tax bills this past year, and the new bills were much more complex than previous years, therefore requiring larger reock and more processing time. In addition to tax bills, Lewis stated, the city had added many new programs to its workload during the past year.

But branch manager Harwood fumed at this maintaining that even if there was a need for added processing in mid-September, the city now is broke as normal and thus has no need of the contested system.

Harwood feels the city's actions have completely violated the letter and spirit of the court ruling, and he questions the ruling's intention since the system is now up and running and the city has no immediate plans to curtail.

The city previously stated it intended to go to public bidding, but only after it had time to bring in an outside consultant for evaluation of long-term needs. The city further stated IBM would not have an advantage in the proposed future bidding by having its system used in the interim.

Attorneys Reingold and DiRisio argued that even if the city were sincere in its desire for public bidding, IBM would have the advantages of already paying for shipping, freight, setup and training as well as the ability to discount its system through purchase option credits.

Local IBM branch manager Clyde Bryant argued this was not necessarily true as purchase option credits were not a permanent guarantee, but could change at any time, and at IBM's option.

(IBM officials said separately that rental credit accrual changes do not occur on an individual-user basis, but collectively.

(Whether Bryant was referring to such collective changes when he denied, in court, that the city had any enforceable right to take an IBM offer of 45% rental-credit accrual, was not made clear. Nor, apparently, will it be made clear in the near future, as Bryant was unavailable to the press. Ed.)

...Potter Drops Action

NEW YORK – Potter Instrument Co. has decided to discontinue any further action in the antitrust damage suit it was considering filing against IBM.

In addition, Potter is canceling our previous suit in return for a product development contract, and we don't intend to institute in the next year or two any other suit," said John T. Potter, chairman and chief executive officer.

Potter added, however, that the IBM contract did not bar future litigation.

The $3.5 million contract from IBM calls for the development of three separate products based on existing Potter lines. These include a helical matrix printer, the Model 1161 magnetic tape unit, and the "Grand Slam" printer which has not yet been formally announced.

Transamerica Files Suit

SAN FRANCISCO – Transamerica Corp. filed an antitrust suit against IBM in Federal District Court here last week on behalf of the Transamerica Computer Corp. subsidiary.

The suit, which asks for more than $50 million in actual damages, is the second to be filed since the Telex/IBM decision finding IBM guilty of monopolization in the plug-compatible peripherals area.

Telex Selling Secrets?

TULSA, Okla. – IBM moved last week to bar Telex Corp. from using any information in Telex's possession on the 3330 (Merlin) disk drive to Digital Equipment Corp.

IBM attorney Thomas Barr said Telex has reportedly signed an agreement with DEC under which DEC would manufacture a disk drive equivalent to the IBM 3330 and claimed that Telex has agreed to supply DEC with drawings and documentation of prototype equipment.

At the same time, IBM Chairman Frank T. Cary emphasized that IBM had no complaint with DEC but rather its only complaint was with Telex.

It is clear, Barr said, from the record in the court case here that Telex has stolen the IBM Merlin trade secret design, sold the stolen design to CDC, and has sought to derive further benefits from the sale of Merlin trade secrets to others."

However, Barr said, "It allowed to consummate this and similar agreements before actual implementation of the court's injunctive relief, Telex will be further unjustly enriched and IBM further damaged."

Therefore, he said, "Pending full implementation of the injunctive release, Telex should be ordered to obtain from DEC all copies of all documentation which have been supplied to DEC and to take no further actions under that contract which would result in the further dissemination of this information.

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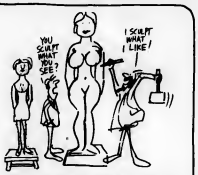

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'More Extensive Than Swedish'

Ideal Privacy Law 'All Inclusive'

By Marguerite Zientara
Of the CW Staff

BOSTON – "More extensive than the Swedish, more sophisticated than the German and more administratively complete than any proposal I know of that has been made anywhere in the world."

That's how Harvard Law School Professor Arthur R. Miller describes the "model" data bank privacy law which he and 25 Europeans coauthored.

The setting of the writing was the Salzburg (Austria) Seminar in American Studies, a high-level, post-graduate institution that holds seven month-long seminars each year on professional topics, and is financed largely by U.S. foundations. From July 15-Aug. 11 a session was held on "American Law and Legal Institutions," with Miller heading a seminar on "Computer Technology and Law."

Not an Offense

The Salzburg draft names the collection, use transfer of any personal information as an offense unless:

- "The defendant acted under authority conferred by statute.
- "The defendant is licensed by the Data Inspection Board (DIB) for all relevant acts and times that otherwise would comprise the offense.
- "The defendant acted within the terms of a consent given by the plaintiff and consent had not been revoked.
- "The defendant's acts were trivial and of a social nature only."

The DIB would be a nine-member board created "to control the entire process of the creation, modification and usage of any data system relevant to the purpose of this statute." The DIB would review license applications from any agencies intending to create data systems. Each application would contain:

- "All personal information that will be contained in the file.
- "The means of obtaining such information.
- "The purpose of the data system, including intended linkages to other systems.
- "The identity of people having access to the data.
- "The identity of the keeper of the record.
- "The security measures that will be included in the system."

Part five of the law draft makes provisions for the "rights of the individuals on whom data is kept." Articles in this section state:

- "In order to collect and store personal information, the keeper of the data system must obtain the written consent of all individuals on whom information is to be kept.
- "Upon request, the individual registered must be given access to his own file at any time.
- "Even without a request from the individual on whom information is maintained, the keeper of the data system shall give notice to the individual registered when a file on him is opened, or information therein is entered, modified or erased.
- "When personal information is transferred to other users, the individual to whom the information and the recipients stating the reasons for the transfer.
- "The individual on whom information is maintained has the right to claim that information which, with regard to the purpose of the system, must be considered incorrect, incomplete or irrelevant, be corrected, completed or erased from the system.
- "All individuals on whom personal information is kept have the right to become members of a union which is to be formed."

The law draft as written is based on a parlimentary form of government and covers governmental as well as private data banks. It was written, according to Miller, as a theoretical model for a data protection statute which might fit the laws of any country.

The law, Miller said, was written by people from 12 or 13 countries representing legal philosophies ranging from the English common law tradition to the Communist law countries.

Miller added the "basic jurisprudential underpinnings of the statute . . . should be applicable in the U.S." and, further, "some of the legislative proposals which have already emerged from Congressman Ed Koch of New York and some that are on the Justice Department drawing board and in Sen. Ervin's Subcommittee on Consitutional Rights will embrace those principles."

As far as any privacy legislation becoming a swift reality in the U.S., Miller does not look forward to a smooth passage in Congress of the HEW proposals [CW, Aug. 8]. "All the proposals – from Ed Koch to Ervin to Justice to HEW – involve the diminution of monopoly control over information by administrative agencies, and they're likely to fight," Miller said.

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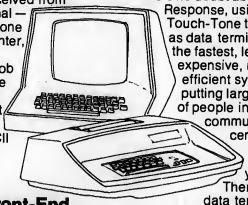

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Few Ways Seen for Fraud To Strike POS Systems

By Marvin Smallheiser
CW West Coast Bureau

LOS ANGELES – Point-of-sale (POS) systems are no more susceptible to fraud than other EDP systems, according to Donn B. Parker of Stanford Research Institute.

Speaking at a seminar on security at the 15th Annual EDP Conference of the National Retail Merchants Association, Parker said there are fewer ways to perpetrate fraud with the POS systems.

Parker, who has made extensive studies of computer fraud, said the computer, while vulnerable, has capabilities that give almost unlimited ability to detect fraud.

For POS, he cited the possibility of developing programs to detect unusual activity which could be coupled with profiles of sales clerks.

This could be done in a cost-effective way, he said.

Manufacturers of POS equipment, he said, have not yet done anything to try to prevent the perpetration of fraud, but he added that customers have not yet asked for it.

What Should POS Do? Communicate

LOS ANGELES – The most important function of POS terminals is as a communication link.

That is how William F. Jones Jr., vice-president of Management Information Systems for the Hecht Co., Washington, D.C., described POS terminals at the National Retail Merchants Association Conference.

Jones described the system at the company's Washington, D.C., and Baltimore divisions, where it has four on-line systems and plans four more by spring 1974.

The four on-line systems are POS, accounts payable, front office purchase order management (FOM) and big ticket.

The four planned are personnel reports, transfers, open to buy and price changes.

There are 1,100 POS terminals, which cost $4 million plus an NCR 101 rented for $7,000/mo.

Jones said rental of IBM equipment runs $40,000/mo, in a configuration that will be enlarged considerably by the spring for disk and core storages.

He estimated the gross return on the investment the first year was 17% and that by the fifth year (next year) it will be 55%.

The system, he said, has produced definite increases in service on the sales floor as well as a decline in fraudulent activity.

But after the first year, savings were 55% higher than projected, Jones said.

He advised retailers undertaking on-line systems to get their EDP staffs up to speed as soon as possible so they will be able to handle the heavy workload involved in setting up the systems.

POS Installation Means New Sales Audit Steps

LOS ANGELES – Sales audit procedures will require a new look with the growth of POS systems, according to A.M. Joseph of Haskins & Sells, San Francisco.

The installation of POS, Joseph said, demands new sales audit procedures that integrate it with the new technology.

Joseph, who spoke at the National Retail Merchants Association Conference, said sales audit procedures should be modified and personnel equipped with CRTs.

With CRTs, he said, sales audit personnel can get access to necessary data bases to know what is in balance and what is out of balance.

Joseph urged the creation of a sales audit manual for DPers.

Returned Whence It Came

MANCHESTER, N.H. – The first commercially installed Honeywell 400 computer is about to return to "dust."

The magnetic tape computer, which was installed at the New Hampshire Insurance Co. 12 years ago, has long since paid for itself and has now outlived its usefulness.

"The first generation machine has no market value whatsoever," said a company spokesman. "We tried to find a new home for it, but it wasn't of sny value even to schools, what with installation and maintenance costs," he said, "so it will simply be junked."

UPC Workshop Sought

LOS ANGELES – The National Bureau of Standards (NBS) plans to recommend that a workshop be held as soon as possible on the universal product code (UPC) and changes that could make it more compatible with other automated merchandise systems.

Zane Thornton, deputy director of the Center for Computer Science & Technology, NBS, said the workshop would be recommended as a result of studies of the responses to a federal register notice.

Thornton revealed the NBS has scheduled a conference on standards for security in the information industry for Nov. 19-20. Proposals made at the meeting will be discussed at a subsequent meeting scheduled March 4-5.

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Bank's Two Small MISs Prove Large Systems Not the Answer

By Don Leavitt
Of the CW Staff

CHICAGO – Management information systems need not be large to be effective, in fact, according to a trio from the First National Bank of Boston, the opposite may be true.

Speaking at the meeting of the Society for Management Information Systems (SMIS), the First team, headed by vice-president Christopher D. VanCuren, described two separate MISs installed on a Hewlett-Packard mini: a Return on Loaned Funds system, called Rolf, and a management accounting system.

Rolf was spawned by the credit crunch in 1969-70, when the bank sometimes had to buy money for more than it could earn by lending the funds to its customers.

Rolf utilizes data extracted monthly from the First's conventional commercial bank applications for 900 specified corporate customers. It couples this with additional information, according to Vice-President Peter W. Stanton, to determine how profitable each customer has been.

A simple formula allows the bank to evaluate each of this group of corporations – which, though small, accounts for the vast majority of the First's business – in an objective way.

The management accounting system filled a gap that existed, operations research officer Arthur C. Traub Jr. explained, between a responsibility accounting system that kept department management on its toes, and a financial accounting system geared to management of the holding company and the stockholders.

It supported the profit center concept but permitted both qualitative and quantitative analyses of variance from expectations.

It is a flexible system, loosely coupled with the responsibility accounting system. It requires a small data base and has very little impact on operation applications since it is used in only periodic planning cycles, Traub noted.

The success of these two small MISs is due to a physical placement of the HP mini and the organizational placement of the operations research department at the First, VanCuren said.

The HP equipment is in downtown Boston, in the corporate headquarters building, while the DP department with a myriad of mainframes is in a special building several miles away. The research staff is also at headquarters and reports directly to the president, so it is peculiarly sensitive to the interests of management and able to respond quickly and easily to special needs.

The Rolf data base includes discreet data about each of the listed customers, and management can ask for any analysis of the available data. The basic "Rolf" valuation is simply the customer's interest plus other income – other expenses, all divided by loans – deposits.

Summing up the First's experience with both of the inexpensive systems (Rolf "cost $25,000 to build, $25,000/yr to operate"), VanCuren noted MIS projects do not have to be DP systems department dependent, and their acceptability and credibility are through the simplicity of the approach used. Evolution based on user needs should develop naturally, he added.

The direct availability of operations research to top management means, he went on, that it is there to solve immediate problems, to make management more aware of the capabilities of DP and to assist in the decision-making process whenever appropriate.

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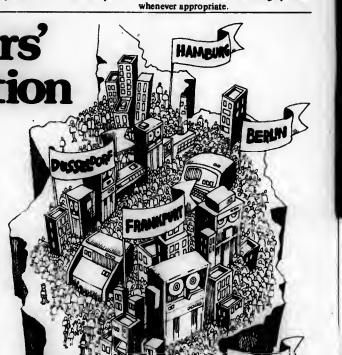

Here's the Schedule:

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Dusseldorf	Nov. 1-3	Dusseldorf Hilton
Hamburg	Nov. 6-8	Kongress Zentrum/ Loew's Plaza Hotel
Frankfurt	Nov. 13-15	Intercontinental
Berlin	Nov. 20-22	Berlin Hilton Hotel
Munich	Nov. 27-30	System '73/ Munich Fair Grounds

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Editorial

The 'Human' Side of DP

The humanization of computers is a worthy goal. Personification is not.

If you will recall some early grammar lessons, you might remember that personification involves giving human traits to animals or things ("friendly" skies, computer error, etc.).

To humanize computers, on the other hand, means making them more responsive to human needs, and this can be accomplished through software or in the man/machine interface area.

Occasionally we slip, printing a story that begins "A computer thinks . . ." or by referring to computers as sports fans or music buffs.

This personification is unintentional; but now a university professor in Scotland has decided the neuter gender is not fitting for computers, and he has declared them feminine [CW, Oct. 10].

We appear to be making some progress in removing the computer mystique, but such well-intentioned people sometimes set us back.

The fact that computers "correct all our mistakes" and have "total recall" and are "admired for their configuration" and are "always right" does not make them feminine, no matter what the professor says.

A better way of promoting an understanding of computers, and acceptance by the public, would be through humanization, not personification.

Letters to the Editor

On Increasing Group Communication

After reviewing the Aug. 29 editorial titled "Iron Curtain" we are uncertain as to your interest in the smaller user groups that have developed over the years to fulfill certain needs of specific data processing functions.

Computer Operations Management Association groups exist in the Chicago, New York and San Francisco areas as independent entities with no national parent association. The express purpose of these groups is to provide frequently scheduled meetings for data center (computer operations) management personnel covering a wide variety of topics and to make available avenues of communication that do not normally exist.

Computerworld could provide a service to groups such as this via inclusion of our meeting dates in its pages.

Russell W. Tukey
President
New York Computer Operations Association
New York, N.Y.

Wanna Make a Trade?

I have just finished reading about the amazing deal made by the Cleveland Trust Co. [CW, Sept. 19]. It traded 2M of IBM core and got 3M of Cambridge Memories core for its two 155s.

Some months ago we started evaluating vendors to supply memory for our 155. At that time Cambridge Memories' salesmen quoted $262,000 for a 1.5M unit of their core..

The resale value, at that time for 3360 (1/2M) units of IBM core was $150,000. Using these figures, had the bank sold its 3360s it would have realized ($150,000 x 4) $600,000. Two 1.5M units of Cambridge's core would have cost ($262,000 x 2) $524,000. This (rather simplistic) analysis would show that the bank lost $76,000 in the trade!

Could it be that it did not investigate this alternative? There really are excellent deals to be had in the 155 memory area, but was this really one?

Sarwar A. Kashmeri
Regional Justice
Information System
St. Louis, Mo.

About six months after obtaining the $150,000 estimate, Kashmeri did in fact sell his memory, but at $130,000 per 1/2M.

Who got the better deal is the question. Cleveland Trust had use of all that memory for all that time, at a trade-in price of $131,000 per 1/2M.

If Kashmeri could have gotten $150,000 back then, it would have been one of the better deals in recent memory! Ed.

Beware of Knowledge

The "advantage of confusion," as cited in Affairs by IBM's Dr. Lewis Branscomb, is something which bears further consideration.

There needs to be a careful balancing between the optimism which Branscomb expresses in promising through applied systems analysis "the hopes of many of the world's nations," and the threat to individual liberty posed by centralization of information. If power corrupts absolutely – and if knowledge is power – the information industries must gravely consider the effects of total knowledge.

Hardy Housman
Fort Benning, Ga.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

'But What Does the President Know About Privacy?'

This May Be Contract Dispute

'No' to DPers Who Play Lawyer

By Gerald H. Larsen
Special to Computerworld

Alan Taylor clearly destroys professionalism over and over again in his column, "Even Good Contract Leaves User 'Hanging by Thumbs' " [CW, Sept. 19]. He begins to destroy professionalism when he steps beyond his boundary of competence as a computer professional and takes positions which are more properly taken by a qualified lawyer.

He then further compounds this by using a nationally distributed column as an emotional cheering section for an apparent underdog. (I actually sat down and wept salty tears when I found out Taylor missed a Sunday concert because he was so busy in the care and feeding of that underdog.)

At a time when the software and consulting parts of our industry are fighting for mature, professional status, Taylor's reckless actions are highly reminiscent of the same childish "ends justify means" philosophy which has destroyed the basic credibility of our present political administration. Such tactics have no place in a professional's workbook.

From everything Taylor has said about the ISC Corp.-Xerox issue, the problems "appear" to be a contract dispute between the two parties. Since this dispute had reached a point where (according to Taylor) Xerox's attorneys were involved, several important questions are immediately raised:

- Where were ISC's attorneys?
- Who were ISC's attorneys?
- And were these attorneys doing?
- Why wasn't ISC told by Taylor to seek the advice of competent legal counsel?
- What makes Taylor feel he is in a position to offer competent counsel or to properly advise ISC of actions to take which would be beneficial to its interests under current statutes?

The Only Advice

An appropriate response to Harold Tamblyn of ISC would have been to summarily send him on his way to seek advice of counsel with the further thought that Taylor would be pleased to act in a technical advisory role *if requested by ISC's attorney of record*. This is the *only* advice which a computer professional should give to a client under the conditions described. To intervene in any other way is a violation of our own professionalism and an assumption of expertise and competence in an area for which we are not qualified unless we have been admitted to the bar.

It is naive and immature to believe that because one has the competence to understand the technical data processing aspects of a contract that one also has the competence to understand the legal and procedural aspects of a contract. (A lawyer, by the way, would be just as remiss if he believed his competence in the legal aspects of a contract somehow gave him insight and competence in the technical issues which lay behind that contract.)

In short, therefore, merely because a person has the title of a "consultant," does not mean he is omniscient in all matters of human endeavor.

Righteous Indignation

It is extremely interesting to watch Taylor's awakening sense of righteous indignation as he discovers some of the inequities in our present legal system. There are not too many of us left who are surprised with the knowledge that, in civil matters, he who has the dollars dominates.

And, if Taylor wants an issue to run up a flagpole, then the fundamental inequity in civil actions is one of the finest issues available. But such issues should not be pursued in a vigilante fashion by trying a particular case in a newspaper column. Newspaper trials are a disservice to equity and do not preserve the basic rights of both parties.

Taylor also fails to perceive another fundamental aspect of the relationship between ISC and Xerox, to wit, the contract itself. This contract should define the relationship between both parties and the rights and responsibilities of each. Since it appears that a contract does exist between the two parties, this raises a number of other questions:

- Was the contract signed under the advice of ISC counsel?
- Were competent technical consultants called in to assist in contract formulation from a technical point of view?
- Did ISC anticipate some of the problems they might have with Xerox? Did their lawyers anticipate these problems? Did their consultants anticipate these problems? If so, what provisions were made in the contract to properly resolve such disputes? If not, why not?

Support for Xerox?

Unfortunately, these questions seem, on the surface, to be placing support behind Xerox. They are not intended to do that. Any positions taken by either party in the particular issue in question must be based on the contractual and physical conduct of both parties before, during and subsequent to any contractual relationship which they created.

The questions are intended to point out that it is extremely common for users, seeking to save a few dollars, to sign contracts without benefit of advice by counsel and, in the case of data processing contracts, without the advice of competent technical personnel. Proper legal and technical contract review prior to signing falls into an area known as preventive law.

And, like preventive medicine, it is always less costly to prevent illness than to cure it.

Gerald H. Larsen is president of Unicorn Systems Co., Los Angeles, Calif.

Rebuttal

The DP Shortage...Old Habits and New Hangups — Part I

Prescreening Based on Arbitrary Policies Damaging

Far too much has been spoken and written about the computer personnel shortage, a subject on which there exists little real expertise.

At issue are old habits and new hangups, a few cliches and some meaningless witticisms, a problem that burdens our field, seemingly unsolvable in a profession that professes to solve the world's problems. Dare we face the issues squarely?

By Brooke W. Boering
Special to Computerworld

Discontinue the widespread practice of prescreening for formal education, age and other inapplicable or arbitrary discriminatory policies.

Of all the factors contributing to the present computer personnel shortage, this is perhaps the most significant and least defensible. Most guilty in this area are our largest employers who hide behind a policy of "corporate personnel guidelines" or some other equally lame excuse.

Quite willing to force hard-core unemployables on their factory supervisors, the business has yet to recognize the need to stop arbitrary screening of white-collar applicants. It is not only indefensible on social grounds, but, as in the case of the computer personnel shortage, totally at variance with the needs and objectives of the organization. Until this practice is discontinued, a huge reservoir of basically capable people will remain untapped.

Adopt a policy of selection based on fundamental aptitude, backed by comprehensive testing and professionally evaluated appraisal.

Like mother, few will take issue with the foregoing, but those who honor it in practice are scarce indeed. The aforementioned "screening" process is the first effective barrier to such selection. The second self-imposed roadblock is the egocentric notion on the part of managers that they are the best qualified to evaluate technical competence.

It is vital that a manager recognize his limitations in this respect and seek the judgment of technically qualified people, at least as a supplement. This is not to say that the manager, per se, is not technically qualified (he may be one of the three programming in this vast land), but rather to urge that the factor of technical competence be judged by the best technician available.

In terms of evaluating test results, this should be left to the personnel pros while the intuitive evaluation might best be done by a senior programmer.

For the site having no technical competence to speak of (not uncommon), the DP manager faces a serious bootstrapping problem which must be his first order of business.

Boering is assistant vice-president, Tallman Federal Savings and Loan Association, Chicago.

Should I Praise the Bank or Blast It?

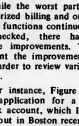
Bank, Hospital Continue to Use Okey Fokey Systems

While the worst part of computerized billing and other business functions continues almost unchecked, there have been some improvements. To some extent the improvements make it harder to review various practices.

For instance, Figure 1 shows an application for a Barclays Bank account, which I was filling out in Boston recently. One of the spaces is for "mother's maiden name."

When I came to this space, I filled it out with a simple question "Why?" Somewhat to my surprise I got a good answer from the bank. "That is there so we can handle telephone inquiries about balances, and other matters," the clerk said. "This way we can check who is calling us."

The Taylor Report
By Alan Taylor, CDP



Basically, the checking concept is sound. But there are problems. The problem of any system that is liable to be computerized – and Barclays is certainly liable to be computerized – is that such check methods are known ahead of time. A well-prepared forger now knows that as part of his plan, as well as getting hold of a copy of a signature, he has to find out the mother's maiden name.

The checking system then is intrinsically vulnerable by its predefinition – even if, on the surface, it appears to be an improvement.

Moreover, it is unnecessarily vulnerable. However, Barclays could have used a coding system which would not be subject to such criticism.

For example, the mother's maiden name request could be replaced by a security identification request. The person filling out the form is asked to provide a security identification field. He is given a choice of several possibilities, each of which has a one-digit code and all of which are items he will most likely not forget. One can be the mother's maiden name. Another could be the father's middle name. A third could be a school he attended. Children's names and birthdates are all suitable. This system is not vulnerable and the cost is nil. Therefore, Barclays' system should be blasted for ineffectiveness.

Since I do not know anything wrong has occurred, I label the current system "Okey Fokey" because while it is OK when everything is OK, it is unknown what damage can occur when the system breaks down.

Another typical Okey-Fokey system is the insurance-type hospital bill. Figure 2 shows part of a bill I received in late August – nine months after the event.

The actual billing is not the "Pay This Amount" figure of $391.21 on the printed bill, but is on a rubber stamp which indicates amount of bill as $391.21; amount received from insurance, $363.01, amount received from patient, $28.30, and balance to be paid, zero.

My question: Is this a reasonable billing system?

There are a number of reasons why it may not be. How does anyone know the billing of the insurance was handled correctly? The insurance company may have paid too little. How does anyone know the correct claim was sent to the insurance company? Perhaps the insurance company is paying too much and my premium will go up?

Realistically, providing bills so long after the event has a built-in possibility of abuse. In the case in point, the bill is actually correct. The patient had no non-insurable services, such as room T.V., and the insurance policy provided only 80% of the room charges.

Still, there was no way on the face of the bill to determine exactly what services the insurance company paid for and how much. Again, as in the Barclays case, it appears to be a matter of faith, rather than facts, which allows the system to work.

And faith is something which can be too easily abused, even though valuable in proper cases. The main ingredient in the prescription here – as in the Barclays case – is control.

The middle columns on the bill could have and should have been used to fill in the specific amounts paid by the insurance company. While no harm is done when the bill is correct, there is no way to tell whether any damage has been done. Therefore, the Framingham Union Hospital must be blasted for perpetuating an Okey-Fokey system.

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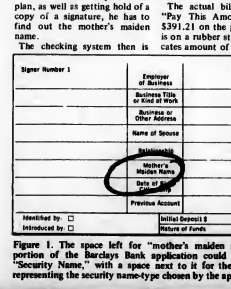
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Name of Spouse
Relationship
Mother's Maiden Name
Date of Birth
Previous Account
Identified by: ☐ Initial Deposit $
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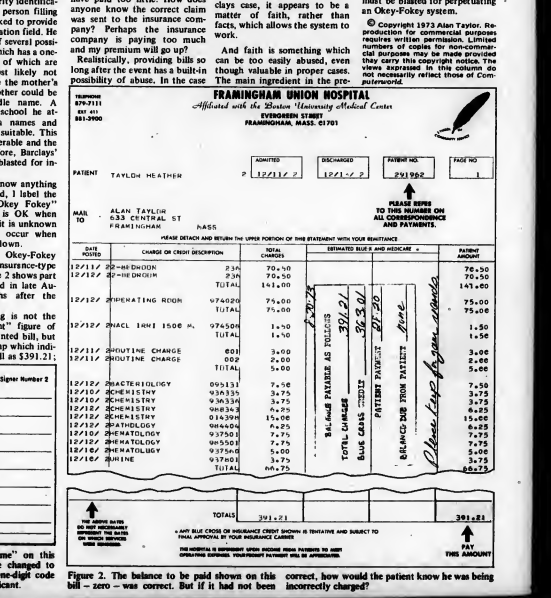
Figure 1. The space left for "mother's maiden name" on this portion of the Barclays Bank application could be changed to "Security Name," with a space next to it for the one-digit code representing the security name-type chosen by the applicant.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12/12/72 R2-HEINDRON 23N 70.50 70.50
TOTAL 141.00 141.00
12/12/72 PREPARATING ROOM 974020 75.00 75.00
TOTAL 75.00 75.00
12/12/72 PNACL IRNI 1500 M. 974508 1.50 1.50
TOTAL 1.50 1.50
12/11/72 PROUTINE CHARGE 601 3.00 3.00
12/11/72 PROUTINE CHARGE 002 2.00 2.00
TOTAL 5.00 5.00
12/12/72 PRACTERIOLOGY 095131 7.50 7.50
12/12/72 PCHEMISTRY 936335 3.75 3.75
12/12/72 PCHEMISTRY 936334 3.75 3.75
12/12/72 PCHEMISTRY 980363 6.25 6.25
12/12/72 PCHEMISTRY 014396 15.00 15.00
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12/12/72 PHINE 937501 3.75 3.75
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TOTALS 391.21 391.21
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Figure 2. The balance to be paid shows on this bill – zero – was correct. But if it had not been correct, how would the patient know he was being incorrectly charged?

Tes·dāta

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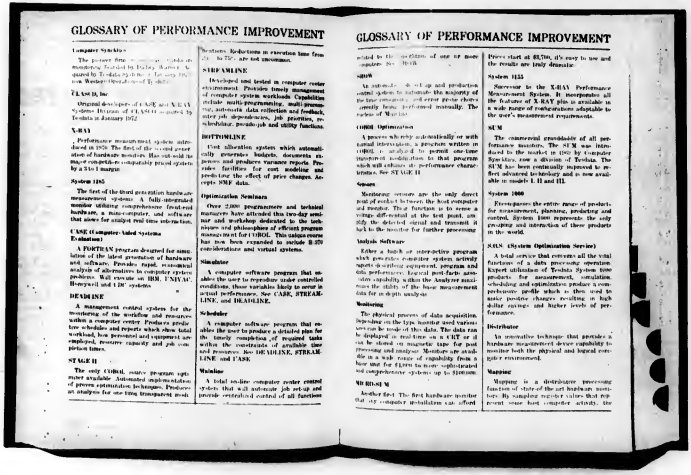

GLOSSARY OF PERFORMANCE IMPROVEMENT

Computer Synchro-

The pioneer firm in computer synchro-monitoring, founded by Dudley Buffington in 1952. Now a division of Tesdata Systems Corporation, Reston, Virginia.

CLASS II, Inc

Original developers of CASE and VIEW systems. Division of CLASS II merged by Tesdata in January 1982.

X-RAY

Performance measurement system introduced in 1970. The first of the second generation of hardware monitors. Has continued to make computer-to-computer priced systems by a 3 to 1 margin.

System 1185

The first of the third generation hardware measurement systems. A fully-integrated monitor utilizing comprehensive front-end hardware, a mini-computer, and software that allows for simple real time interaction.

CASE (Computer Aided Systems Evaluation)

A FORTRAN program designed for simulation of the latest generation of hardware and software. Provides rapid, economical analysis of alternatives to computer system problems. Will execute on IBM, UNIVAC, Honeywell and CDC systems.

DEADLINE

A management control system for the monitoring of the workflow and resources within a computer center. Produces predictive schedules and reports which show total workload, how personnel and equipment are employed, resource capacity and job completion times.

STAGE II

The only COBOL source program optimizer available. Automated implementation of proven optimization techniques. Produces an analysis for on-line interactive modifications. Reductions in execution time from 5% to 75% are not uncommon.

STREAMLINE

Developed and tested in computer center environment. Provides timely management of computer system workloads. Capabilities include multi-programming, multi-processing, automatic data collection and feedback, interjob dependencies, job priorities, rescheduling, pseudo-job and utility functions.

BOTTOMLINE

Cost allocation system which automatically generates budgets, documents expenses and produces variance reports. Provides facilities for cost modeling and predicting the effect of price changes. Accepts SMF data.

Optimization Seminars

Over 2,000 programmers and technical managers have attended this two-day seminar and workshop dedicated to the techniques and philosophies of efficient program measurement for COBOL. This unique course has now been extended to include S/370 considerations and virtual systems.

Simulator

A computer software program that enables the user to reproduce under controlled conditions, those variables likely to occur in actual performance. See CASE, STREAMLINE, and DEADLINE.

Scheduler

A computer software program that enables the user to produce a detailed plan for the timely completion of required tasks within the constraints of available time and resources. See DEADLINE, STREAMLINE and TASK.

Watchtime

A total on-line computer center control system that will automate job set-up and provide centralized control of all functions related to the installation of one or more computer sys- tems.

SRM

An automatic set-up and production control system to automate the majority of the time consuming and error prone choices currently being performed manually. The author of Watchtime.

COBOL Optimization

A process whereby automatically or with manual intervention, a program written in COBOL is analyzed to permit one-time improvement modification to that program which will enhance its performance characteristics. See STAGE II

Sensors

Monitoring sensors are the only direct point of contact between the host computer and monitor. The job function is to sense a voltage differential at the test point, amplify the detected signal and transmit it back to the monitor for further processing.

Analysis Software

Either a batch or inter-active program which provides computer system activity reports in various equipment, program and data performance. Logical post-facto assessment capability within the analyzer maximizes the ability of the basic measurement data for in-depth analysis.

Monitoring

The physical process of data acquisition. Sampling on the type hardware used various sensors be tested at the data. The data can be displayed in real time on a CRT or it can be stored on magnetic tape for post processing and analysis. Monitors are available in a wide range of capability from a base unit for $12,000 to more sophisticated and comprehensive systems up to $500,000.

NO HIDDEN M

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System 1133

Successor to the X-RAY Performance Measurement System. It incorporates all the features of X-RAY plus is available in a wide range of configurations adaptable to the user's measurement requirements.

SEM

The commercial consolidate of all performance monitors. The SEM was introduced to the market in 1981 by Computer Synchro, now a division of Tesdata. The SEM has been continually improved to reflect advanced technology and is now available in model I, II and III.

System 2000

Encompasses the entire range of products for measurement, planning, predicting and control. System 2000 represents the only grouping and interaction of these products in the world.

SOS (System Optimization Service)

A total service that extracts all the vital functions of a data processing operation. Expert utilization of Tesdata System tools provides for measurement, simulation, scheduling and optimization produce a comprehensive profile which is then used to make positive changes resulting in high dollar savings and higher levels of performance.

Distributor

An innovative technique that provides a hardware measurement device capability to monitor both the physical and logical computer environment.

Mapping

Mapping is a descriptive processing function of state-of-the art hardware monitors. By sampling register values that represent some host computer activity, the

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What Happens When a Firm Inexperienced in DP Joins Service Bureau With Urge to Experiment?

By H.B. Taylor
Special to Computerworld

"Point-of-sale registers cost too much. Get a hold of that guy downtown who does Bob's accounts receivable report. See what kind of system he can come up with."

Top management has spoken. Unknowingly it has unleashed near-total destruction upon the working systems of a $13 million retail apparel company. The following account is true; it took place in the company I worked for.

For many years this company has been a profit leader among numerous operations owned by our parent concern. Our systems and procedures have been held up as an example to others. In the three years I was controller, inventory shrinkage was less than 1%. Taking authority from 11 years' experience in retail accounting, I can safely state we were doing things better than the average comparable company on manual systems.

Streamlining Called For

Promotions out and one early retirement took a heavy toll at the executive level. Suddenly new management decreed the solution to many of our problems would come from streamlining the operation.

Put everything on a computer; eliminate all those cranky old women who do the sales audit; get 10 times the information presently available for the merchandise buyers; speed up credit authorization by pushing a button and having an instant replay pop up on the screen. The advantages were unlimited. Just think: make one pass at a salescheck and everything else would miraculously appear on the desk in the morning!

We spoke with representatives from IBM, NCR, Singer-Friden and others. The necessary capital outlay didn't meet the rapid success pattern envisioned by management. All that depreciation/amortization, wow!

Finally a local service bureau was asked to take a crack at the situation. It had been handling our accounts receivable for several years, and would like to try its hand at an entire system.

Volatile Courtship

So the courtship began between two rather volatile partners, i.e., a company with executives not experienced in computerization and a service bureau with the yen to experiment.

The weeks that followed were filled with meetings, questions and unwavering reassurances. I was excluded from the discussions *in toto*. The reasoning was that the initial startup would be strictly to obtain merchandise statistics. Sales audit would not be affected, and after all, the new executives in charge were old merchandise men, so what could an *accountant* contribute?

Twenty days before going live on the system it was decided our salescheck would have to be redesigned to meet the computer format. It took a distant printer and the air express carrier 22 days to deliver. Program changes were being made almost daily as management blissfully made "refinements" to our unproven system. It continued to do this on the eve of going live.

On May 17 at 4:30 p.m. someone got around to telling me two rather incredulous facts. The next morning, Friday, a representative from the service bureau would be out to begin training my girls to input data into the CRT terminal! *My* girls, who were carrying a full workload already and rushing to meet various deadlines for parent company requirements. Furthermore, the system would go live in 10 days, May 28. That's right, Memorial Day.

Recovering from the shock, I stormed into the vice-president's office to see what the devil was going on. He was braced and ready for me. Jaw set, he had the look of a compulsive gambler shoving his last dollar through the window to bet on a long shot. Discussion was useless. I was curtly informed that the input of

A Sad Tale

saleschecks into the system was my responsibility and that the system *was* going to work. Surmising that Junior had obviously overplayed his hand, I went back to my office to figure how to bail us out. This is how it went:

May 18, Friday – Marge came out from the service bureau. We discussed training requirements and I was informed that an hour a day with each of three girls would be ample to make efficient terminal operators out of them by the 28. I shifted the workload around, scheduled some overtime and turned three of my girls over to Marge, and put an ad in the paper for CRT operators. The terminal was inoperative all day. No training was accomplished.

May 19, Saturday – Marge doesn't work Saturdays.

May 21, Monday – Each of my three girls received one hour instruction.

May 22, Tuesday – This was to be my day to learn the operation. Spent two hours with Marge. Terminal was malfunctioning. We entered three successful transactions, one salescheck. No training of the girls was attempted. A new terminal was set up in my office. "Training" had been done on the tube in the merchandise office up to this point.

May 23, Wednesday – Neither machine working – no training.

May 24, Thursday – Each of three girls received one hour of instruction. Minor machine problems encountered.

(Continued on Page 14)

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A Firm Learning DP, a Service Bureau: This Courtship Yields Strange Results

(Continued from Page 13)

May 25, Friday – A representative of the parent company came down to observe the operation on the tubes. He worked with the terminal all day. No training accomplished with girls on saleschecks.

(Note: Up to now, the terminal in my office has not worked at all. I have not seen a sample of the printout to be received from the computer. Neither has Marge.)

May 26, Saturday – No one from the service bureau showed up.

May 28, Monday – Scheduled to go live today. Not one girl in the office has received enough training to perform the operation correctly. We postpone going live until the 31st.

One of the men from the service bureau came out to work with the girls I had called to work on the holiday. He spent an hour with them and left – just never came back from lunch. This happened even though he was told I had hired a new girl to operate the terminal and wanted him to spend the afternoon training her. When she reported for work at 1 p.m. as scheduled, there was no one there to train her. Paid for four hours and sent home.

May 29 and 30, Tuesday and Wednesday – Marge got her time schedule mixed up and wasn't available to spend much time with anybody. Service bureau shut down equipment for internal problems at 1:30 p.m. Wednesday.

May 31, Thursday – We began entering saleschecks live into the system. At 10 a.m. we entered the first successful transmittal. At 11:15 the terminal in my office went out. Six stores were entered all day. We have 18.

(Note: I was standing behind the service bureau representative when he entered the first live transaction. The tube came back with an "OK" message, meaning a successful entry. John said, "Well I'll be damned! How about that?" The tone was definitely one of disbelief.)

A Bit of a Setback

What happened the following week was enough to cripple my organization for months to come.

All of a sudden the data input which was "strictly for merchandise information and would not affect sales audit" took precedence over my normal routine. The saleschecks *must* be entered into the system before giving them to the audit girls for balancing.

For one week my regular workers sat on their thumbs waiting on half-trained terminal operators to struggle through entering the data. Saleschecks and cash register tapes alike got lost in the shuffle. You should try to meet a weekly payroll for commission salesmen under those conditions!

Whose Responsibility?

As the responsibility for making it all work had been not-so-gently dropped on *my* head, the VIPs were constantly into everything, questioning, criticizing, etc. I suppose Dillinger was a "professional man," too.

A week after punching began, I was shown the printouts generated by the computer, and questioned the exceptionally large number of inventory items which were classified as "non-posted data." I found out the service bureau had not entered the physical inventory yet, so there was nothing for the program to match units sold against except POs entered that week!

Planning is priceless!

Taylor is now a free-lance writer and a former controller of a large Florida apparel company.

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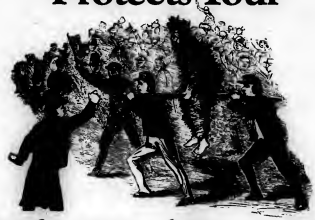

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SOFTWARE&SERVICES

Software Supports Dual 2927

ALEXANDRIA, Va. – Users who have become discouraged by time spent printing, even with the Power II spooling capability, can now move the whole operation to an IBM 2927 Off-Line Printer supported by software from Value Engineering Corp.

The 2927 is part of the 29XX line of equipment [CW, Sept. 19], available from IBM on a Request for Price Quotation (RPQ) basis, and is not in the regular product lists. It includes a stripped-down 360/25; a dual tape drive unit based on the 2415s used with 360/20s; and either one or two 1403 printers.

The CPU comes with either 8K or 16K of memory and the logical unit is limited to those operations related to tape reading and printer operations. There are no Multiply, Divide or decimal arithmetic operations hardwired into the unit.

There are other limitations as well. The tape units have had their arm mechanisms disabled, and there is no conventional console on the CPU although there are facilities through which the operator can communicate with the system.

Value developed its software package when the programming provided by IBM proved inadequate for dual printer operations. The independent package is available for either single or dual systems and can use ANS forms control characters or IBM machine code forms control characters. All Ditto tape-to-print functions (originally used on a user's mainframe) have been implemented, Value said.

Fixed- and variable-length records, blocked or unblocked, are acceptable to the system. DOS Power II users with the tape writer feature can spool to tape and later print on the IBM 2927, instead of on-line. Other spoolers that allow tape as an intermediate storage media can be handled as well, Value said.

Standard IBM 360/370 tape labels are recognized and a set of special control functions gives the user restart and tape-positioning capabilities.

The package, written in Assembler, can be assembled on the user's host 360 or 370 and then loaded into the 2927. It ranges in cost from $2,250 to $2,850, for a five-year lease including maintenance and updates.

Value is at 2550 Huntington Ave., 22303.

ICA Group Wonders
Cobol... International DP Language?

OTTAWA, Ontario – The Intergovernmental Council for ADP (ICA) has voted to set up a study group "to assess the advantages to be gained by adopting Cobol as the prime or sole choice as an international data processing language."

A positive finding by the study group could lead ICA into working closely with Codasyl "for the betterment of production of a more effective and globally standardized Cobol language," according to the text of the proposal that caused establishment of the initial study group.

ICA is an informal group of people who hold policy-level positions in the DP operations of their respective national governments. Governments themselves are not members of ICA nor are they necessarily bound by the council's decisions.

There were, nonetheless, representatives of 17 nations at the ICA meeting – held here recently – who established the Cobol study group. The proposal was made by Gordon Henderson, director general of the Computer Services Bureau, Department of Supply and Services, of the Canadian government.

Henderson agreed, after acceptance of his proposal, to head up the study group. Other members from three or four countries are still to be nominated to the group, but its work should be complete in about a year, he estimated.

ICA is not another standards organization, Henderson stressed, and it does not want to set up any structure competing with Codasyl to handle development of the language. Instead, he said, it "will offer assistance to Codasyl] and to use our influence – within our national governments – to support these developments, as users not as governments, per se."

Support for Codasyl's efforts, particularly the Cobol development work of the Programming Languages Committee (PLC), should, Henderson's view, shorten "considerably" the standardization process now followed.

He reminded ICA that Codasyl is currently a non-funded body relying solely on voluntary support. That being the case, he said, "it is surprising that so much is achieved" but more could be done with the additional support ICA could bring.

Since Canada is currently the only non-U.S.-based representative on PLC, he continued, "it follows that all deliberations and decisions may, to some degree, be influenced by North American, rather than truly global, knowledge and needs." Formalizing ICA's interest in Cobol might counteract such a bias, to the benefit of all, he concluded.

Programmers Feel More Able, Productive, With VMOS Support

By Don Leavitt
Of the CW Staff

ATLANTA – Programmers working in a virtual memory environment feel they can write more sophisticated and improved programs and are generally more productive than they would be in a conventional setting, according to a study conducted by Emory University Computing Center here.

Emory has been operating under VMOS on a Univac Series 70/7 for some time and the study was started to solicit programmers feelings and opinions about their experience with virtual memory, explained Brent A. Blumenstein, coordinator of digital computing at the center.

Though the university has both interactive "problem-solving" and conventional assembler or compiler-oriented programmers, Blumenstein said his questionnaire showed the benefits of the virtual memory were more dramatic in the second group. And some of the results were in apparent contradiction to what might be expected.

Most of the respondents, for example, said they wrote programs that were either the same size or smaller than they had been writing in a batch-oriented system.

The facilities included in the mature VMOS – which started under RCA as Time Sharing Operating System on the Spectra 70/46 and 70/61 – made it easy to check out programs and to piece new ones together from "pieces" that already existed.

One programmer who found himself writing larger programs said he enjoyed not having to fit a program into available core. His previous experience was with an extremely memory-bound computer, Blumenstein noted.

Whether VMOS tended to encourage modular programming was not clearly answered, the coordinator went on. One programmer said the ease with which a large program can be written, edited, compiled, debugged and run on the demanding-paging system made modular approaches unnecessary.

Others said their choice of language rather than the operating system was the determining factor in whether they produced modular programs. Those who did follow modular techniques, however, noted – again – that the services supported by VMOS encouraged them.

All respondents claimed an increase in productivity and these ranged from a fairly modest 30% or 40% to a whopping 1,000% return. Blumenstein claimed. They said the improvement was caused by better turnaround on compiles and assemblies, better debugging aids, ease of program source editing and an improved understanding of the machine due to "more intimate contact."

Four of the 15 respondents told Blumenstein VMOS made them better, as well as more productive, programmers, apparently because the system helped them see errors promptly and avoid them later. Another four programmers, however, argued the system made them sloppier, though more productive. "Why spend a lot of time debugging when the machine can do it more easily?" they asked.

Blumenstein felt he was left with the question of whether the increased productivity declared by the same programmer who saw himself as more sloppy was an acceptable trade-off.

On a more positive note, he said the raised spirits and better job attitude displayed by the programmer working with a computer which is easy and pleasant to use, though not measurable, "is not insignificant."

DEC Moves Paper Tape Operations To Cassettes With Caps Systems

MAYNARD, Mass. – Paper tape operations can be shifted to a magnetic recording environment with the introduction by DEC of the Cassette Programming System-11 (Caps-11) for the PDP-11. A somewhat simpler Caps-8 is also available for the PDP-8, the company said.

Caps-11 is described as a complete operating system for laboratory experimenters, industrial researchers and other users who have been paper tape-bound until now. The cassettes are more convenient and more reliable than paper tape, DEC said, and are "ideal" for collecting, retrieving and manipulating relative small amounts of data.

The system software includes an editor, a relocating assembler, linker, debugger and file utility program. Assembler is the only language processor supported by Caps-11, indicating that programs in other languages developed under DEC's other operating systems cannot be used in this new environment.

Phillips-type cassettes are used although DEC claims to have enhanced the physical makeup of the tape, its coating and handler to give it "about 10 times the lifespan" of ordinary cassettes. Each can hold an average of 1½ programs.

Minimum hardware configuration for Caps-11 is a PDP-11 central processor with 8K of memory, a TA-11 dual magnetic cassette unit and controller and a console terminal.

The software system is available through license at $300.

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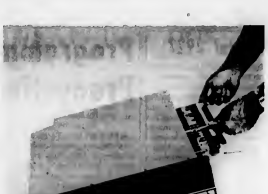

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MUL	3.75	3.75max	3.6	8.8	3.6	5.5
DIV	4.35**	4.05max	3.6	8.8	3.6	5.8
SHIFT	3.75	Feature not available	3.6	Feature not available	3.6	Feature not available

*Published execution time for an UNSIGNED operation
**For Unsuccessful Division (overflow) – 3.15 microseconds

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Construction Funding Eyed

DES PLAINES, Ill. – Companies planning or controlling expenditures before they go under fixed assets accounting can have reporting of all cost (capital and expense) and time commitments with the Programmed Appropriation Commitments-Fixed Asset Control System (Pac-Facs) from American Valuation Consultants Inc.

Pac-Facs controls appropriations and construction-in-process information, and analysis is made of amounts budgeted, committed – through purchase orders or in-house work orders – and spent.

The system minimizes potential appropriations overruns, the company said, since it permits timely changing of internal and external commitments.

Pac-Facs allows exception reporting to highlight variances among appropriated, committed and spent funds. It also includes several levels of summary and detailed reporting so management can have the exact mix of information it needs.

The system is written in ANS Cobol and runs 24K partition under DOS/360. Source code is available for $3,500.

The company is at One North Broadway, 60016.

Basic, Fortran Added for Minis

OCEANPORT, N.J. – An extended Fortran IV and a single-user Basic language processor have been announced by Interdata Inc. for use on the company's New Series of minicomputers.

The extended Fortran IV goes beyond ANS Fortran, the company said, and includes mixed-mode arithmetic.

The processor requires 16K bytes of memory and can be used with Interdata's models 4, 5, 70, 80 or 85 processors equipped with hardware floating point and at least 24K bytes.

The package contains a run-time library and a command-driven loader. It sells for a one-time price of $100.

The single-user Basic is an extended form of Dartmouth Basic. It runs under any of the company's operating systems, and takes in 16K bytes under the Basic Operating System.

The Basic package carries a one-time price of $150. Both new packages can be ordered from 2 Crescent Place, 07757.

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COMMUNICATIONS

Data Briefs

AT&T's 9,600 Bit/Sec Modem To Include Multiplexing

NEW YORK – AT&T will introduce its 9,600 bit/sec data set in the spring of 1974. The 209 unit will include a built-in multiplexing capability, according to an article in the October issue of the *Bell Laboratories Record*.

The 209 will be the only Bell data set to have the multiplexing capability, according to an AT&T spokesman. It will simultaneously handle two 4,800 bit/sec data streams or four 2,400 bit/sec data streams. A dial-backup feature will allow 4,800 bit/sec on a dial-up facility with the 209, the article said.

Optical Mark Reader Retransmits

CHATSWORTH, Calif. – Chatsworth Data Corp. has come up with an optical mark reader for transmitting source data to a CPU or remote data accumulator over phone lines. The unit can retransmit when the receiving device detects a transmission error.

The Model 3600-Recom reads pencil-marked, punched and preprinted cards singly or both sides at once. It converts data to either Ascii or Ebcdic code format and transmits it with start of text, end of text and end of block control characters.

The unit reads cards singly on demand at a one card per 100 msec rate. Data is transferred to a document buffer and is then transmitted at 110- to 2,400 bit/sec.

The Model 3600-Recom costs $3,410 with delivery from the firm at 9732 Cozycroft Ave., 91311.

NCR Register Programmable

DAYTON, Ohio – NCR has a stand-alone, programmable electronic cash register which can perform off-line capture of data onto cassette tapes.

The Model 250-7000 can be programmed for varying applications by feeding coded instructions on punched paper tape into its memory, the firm said.

The register can post credit charges and payments, offer optional automatic price scanning and/or cassette data capture and provide 100 individual totals.

Registers can be linked to a single "master" register for consolidated reporting. Individual registers can compute taxes, extend prices on quantities, compute split-package prices, multiply by fractions and compute and dispense change to customers.

The NCR 250-7000 costs $4,395. Two tape cassette unit models are available, with one at $795 and the other at $1,200. A data wand costs $850.

Delivery will begin in the first quarter of next year.

Display and Hard Copy

Mobile Terminals Tied to Crime Data

By Patrick Ward
Of the CW Staff

ALBANY, N.Y. – When the New York State Police found that delays in relaying messages between patrol cars and terminals at headquarters were preventing best use of criminal data files, they decided to put terminals in the patrol cars.

In April 1972 the state police installed Kustom Electronics MCT-10 mobile communications terminals in four police cruisers based in Troop G's Loudonville barracks near Albany.

"There was competition in Sylvania's Digicom and possibly one other, but in our evaluation we felt that Kustom Electronics was the best at that time," said Fred Frank, director of data processing for the state police.

"One advantage was price, another was the size of the screen, which was substantially larger; and it had hard-copy capability," Frank said.

The Honeywell-manufactured plasma screen "is a mercury vapor and copper wire arrangement" using a dot matrix, according to Sgt. Joseph Gallelli, chief technical sergeant the station handling the MCT-10 operations.

The unit is compact, he said. "With this you can get a much larger screen with a lot less depth." (The MCT-10 displays 256 characters.)

The terminal also has an alphanumeric keyboard and a Hewlett-Packard-designed hard copier.

"One command by the operator gets a hard-copy printout," Gallelli said. "Whatever is in the buffer, he punches Print and it does. And the buffer consists of 256 characters plus the screen which is also a buffer, so a total of 512 characters can be buffered at one time."

The terminal transmits and receives over the radio used in the patrol car, which determines its range.

Kustom rates the MCT-10 for transmission at 1,200 bit/sec. But, "because we have a consecutive tone-signaling system for our base station, we have to filter out these tones. This filter caused the carrier to be changed, so Kustom had to reduce the bit/sec rate to 866," Gallelli said.

To send a full keyboard of information takes 1.8 second of air time, he said, which accords "with FCC rules which say that you won't modulate a carrier with tone for longer than two seconds."

The receiving station consists of a Kustom-adapted Motorola control unit. This feeds into Kustom's EDT-10 modem which is plugged into a 4K DEC PDP-11 which switches input and output information into the state police Univac Series 70/6 mainframe with 256K.

In a typical use of the system, Frank said, "An individual is stopped on the road, and the officer, before he even leaves his car, is able to ascertain by making a license check who owns the vehicle, and whether the car is wanted or not.

"When he goes to address the individual," Frank noted, "he has in hand a great deal of information."

The police car terminals can access the FBI's National Crime Information Center, state Department of Motor Vehicles and state police data bases.

Average transmission time is .8 seconds, Gallelli said, with a typical inquiry and response transaction taking less than 15 seconds. This compares with the four to eight minutes needed for a manually handled transaction.

The dispatchers key the requests into Teletype Model KSRs and ASRs, but the state police are planning to upgrade to video display terminals, Gallelli said.

The four mobile terminal cars have finished a test period and now operate on a routine basis, Gallelli said, but he stressed they are an operating subsystem only, and that "not even Troop G's radio network depends on mobile digital."

While there are no firm plans yet, the New York State Police seem interested in expanding their use of mobile digital communications.

Sanders 3270-Compatible System May Save Users $150/Mo Over IBM

NASHUA, N.H. – Sanders Data Systems has come out with an interactive terminal system using a programmable controller. The system is said to be plug-compatible with IBM 2260 and 3270 systems.

The Sanders 8170 system includes a 16K microprocessor, CRT displays with keyboards, modem interface and software and is available in configurations ranging from two to 32 CRT terminals.

The microprocessor uses 12K to emulate the IBM 3270.

Options for the 8170 include 4K of additional memory, 30- and 165 char./sec and 600 line/min printers and CRT screen sizes of 480, 960 and 1,920 characters.

The control program provides the standard IBM 3270 terminal control functions and binary synchronous line control.

Most functions can be controlled from the keyboard including data fields to be totaled, subtotaled or zero-balanced or check digit verification to be performed. Some functions, such as range check and check digit calculation, can be performed automatically without keyboard intervention.

A cluster of five CRTs with keyboards, microprocessor and modem interface leases for $740/mo on a one-year lease, with a $29,000 purchase price.

The lease price for a comparable IBM 3270 configuration would be $890/mo, a Sanders spokesman said.

First deliveries of the Sanders system are scheduled for January 1974 from the firm at Daniel Webster Highway South, 03060.

System Uses TV Cable for Data

ANN ARBOR, Mich. – Interactive Systems, Inc. has come out with radio frequency-to-digital modems and controllers to allow use of a CATV-type cable as a full-duplex data link in factory applications.

The cables are designed to carry very wide band television information and have a radio frequency capacity of 300 MHz, a spokesman said. Since data transmission requires much lower bandwidths, users could fit three or four very high-speed data channels in the bandwidth normally used for one television channel, the company said.

"There is no plant in the world that can use up the capacity of one of these cables," the spokesman continued. One cable can accommodate 10,000 terminals of various kinds, he explained, adding he did not know of a factory in the world with that number.

One of the minicomputer controllers can handle up to 1,000 terminals, acting as a data concentrator/data communicator off the cable, the spokesman said.

Interactive Systems has already installed its cable communications system in factories in the Detroit area, the spokesman said.

A typical system might cost about $40,000, the spokesman mentioned. The data concentrator system, including mini, computer modem and control software would cost about $30,000, and the cable itself costs $1.25/ft installed, with no conduit required.

Interactive Systems, Inc. has a booklet entitled "Coaxial Cable: A New Utility for Data Communications," available on request from the firm at 327 S. 4th Ave., 48108.

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Proper Management Approach Urged in Telecommunications

SAN DEIGO – One of the most important tasks of the telecommunications manager is his presentation to management on the need for a new or upgraded network. A seminar at the recent Tele-Communications Association conference dealt specifically with this subject. Called "The Recommendation," it gave users a primer on the best way to present a communications plan to management.

Walter Long, manager of corporate communications at General Dynamics, cautioned attendees against presenting too much information about proposed changes in written memos to management. He also advised the communications managers to tailor their upgrade recommendations to fit the needs of either operational-level or executive-level management.

Operational management needs a detailed technical explanation of proposed changes while top-level executives are only interested in how much a new network will cost, he said.

Communications managers should be prepared not only to explain what they want to do but they should also be ready with justified reasons on why they want to implement their plans at a particular time. "Don't be caught when your boss asks why you want to make a major change now," he advised.

Users at the session agreed that preliminary memos should attract the interest of management but they should not give the whole story. After company officials become interested through initial written descriptions, the communications manager should follow through with a detailed verbal presentation to make his recommendation, the session attendees agreed.

The initial memo should be an "attention-getter" and if written properly it will result in operational management helping the communications manager to get his approval from company executives, Long said.

AT&T Harm Figures Called Misleading By ITT Affiliate

WASHINGTON, D.C. – AT&T's charge that 30% of the customer-provided equipment connected to the phone network was causing harm "is not worth the paper it is printed on," according to an ITT Terryphone Corp. official.

In a letter to the FCC, H.M. Eaton, vice-president and general counsel, said AT&T's private-line problem report "contains what we believe to be some false and misleading information, and is statistically unsound.

"They report that of the trouble reports they analyzed, 48% were caused by customer-provided equipment, 38% were caused by telephone company equipment and 14% had cleared up before their service personnel arrived to analyze them.

"This is a rather interesting fact, because it has been our experience and the experience of all of those companies in both the private communications field and the interconnect industry, that 100% of these 14% that cleared before their arrival were undoubtedly telephone-company caused. Thus, based on the telephone company's own figure, 52% of the problems were caused by the telephone company equipment and 48% by the customer-provided equipment," Eaton said.

"A further interesting item is the fact that of the 4,973 customer equipment caused problems, only 1,463 were described by Bell as harmful. Thus, only 14% were harmful problems and not 48% as the general tenure of Bell's report would lead you to believe," he said.

"The telephone company has for a number of years, developed an almost 'knee-jerk' type of a response to reports of problems with either leased lines or interconnected systems and after making only the most cursory of investigations, they tell the customer that the problem is not in their equipment or lines, he said.

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Strategy in Plug Compatible Tape

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Strategy in Add-On Memory Markets
IBM's strategies to offset efforts of PCM competitors, including references to new products, enhancements to existing products and alternatives to those marketing practices forbidden by the Tulsa decision. $495 each.

If you have the exhibits, we have the key word index, $750

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Bits & Pieces

Floppy Disk System Has Interfaces for Most Minis

DARIEN, Conn. – The Disc-8 system is a minicomputer plug-compatible mass data storage unit which includes OS and diagnostic software, and I/O drivers with storage capacity of 262K bytes (expandable to 1M byte), available from Digital Associates Corp. here.

The system consists of up to four cartridge-type disk drives, a formatter containing all format and control logic for the drives and an interface to the external minicomputer or computer system.

Interfaces are available for all popular minicomputers.

Prices for the Disc-8 system start at $2,950 for a single drive and $3,950 for dual drive. Prices include all hardware, plus operating and diagnostic software. Lease financing and nationwide maintenance is available from the firm at 1031 Post Road, 06820.

DEC Systems Include GT-44 For Graphics, and . . .

MAYNARD, Mass. – A graphics system from Digital Equipment Corp. is designed as a mid-range system, bridging "the gap between table-top graphics displays and . . . more powerful dedicated computer graphics systems," according to the firm's spokesman.

The GT-44 consists of a PDP-11/40 minicomputer with 16K words of memory, independent graphics processor, 17-in. video display monitor with light pen, disk subsystem and console.

Software consists of Basic-GT, a graphics version of the Basic programming language that runs under RT-11 operating system.

For current users of DEC graphic systems, the newer GT-44 fits between the GT-40 and the Graphics-15 systems.

The system costs $34,500.

. . . Declab Used in Hospitals

MAYNARD, Mass. – Declab is a minicomputer-based system designed for hospital laboratory applications.

Produced by Digital Equipment Corp.'s Laboratory Data Products (LDP) Group, the system consists of a PDP-11/40 minicomputer with 16K words of memory, independent graphics processor, 12-in. video display, disk subsystem, laboratory peripheral system and console.

Software is built around the RT-11 operating system and Sparta-11 – a modular signal processing package. Sparta-11 contains acquisition, display, report generation and manipulation modules.

The Declab system costs $37,500 with deliveries scheduled for February 1974.

128K Bytes Brought In
Add-On 145 Touted as Complete Success

By Michael Weinstein
Of the CW Staff

WELLESLEY, Mass. – One of the first users to configure an IBM 370/145 with add-on memory has reported no problems after one month and marked increases in system capability.

Thomas Litle, president of Information Services, Inc. here, added 128K bytes of semiconductor add-on memory from Memory Technology, Inc. (MTI) to his Model N1 370/145.

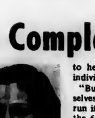
User Casebook

The 128K-byte MTI add-on was brought in during the first part of September and installed in two phases, Litle said.

In the first phase the interface needed to attach the memory to the IBM mainframe was checked. While MTI personnel had developed the techniques needed to attach their memory, they still needed time with a running system to implement the process, he added.

This process involved overlaying microcode on the floppy disk used to control memory. In addition to being simple, this method allows the user to take the add-on memory off-line merely by initializing the system. If Litle then wants to bring up the MTI 128K-byte portion, he can run cards that overlay the microprocessor native to the IBM mainframe.

Therefore, both MTI and Litle expect no problems in getting IBM to maintain the newly configured system.


Winiecki

Prior to the new memory, Ken Winiecki, vice-president, technical development for Information Services, was running his 256K IBM-supplied Model 145 in four partitions under OS.

A 16K-byte partition was dedicated to tape-to-print spooling operations. A 144K-byte portion handled written OS output – disk to printer data. Two batch partitions – 68K and 98K – were used for actual work operations.

This CPU configuration was used with nine Storage Technology Corp. (STC) 9-track, 1,600 bit/in. tape drives, six Marshall disk drives – three double-density and three single-density, providing an on-line storage capability of 25M byte – and three IBM 1403 line printers.

System operation supported the firm's service of taking publication mailing lists to help control circulation and produce individualized letters and other literature.

"But as time went by, we found ourselves with mostly programs written to run in the 98K-byte partition. This meant the 68K-byte partition was left idle while programs backed up waiting for the larger partition," Winiecki added.

This bottleneck was quickly acting to give the system a "major case of indigestion" where it worked nearly 24 hours a day, seven days a week just to keep even, Litle said.

"Since we had one of the earlier 145s, we would have had to pay $16,000 just to upgrade our CPU if we had wanted to add IBM memory," he added.

"As we looked for alternatives, we learned that MTI was building add-on memory for the 145 and thus a sort of marriage was formed where we allowed MTI to use our 145 for the first installation and we in turn gained the added advantages of being a first user," Litle said.

"By being a first user, we received very good financial terms, guarantees and even were able to make a deal where we sold time to the developer for testing," Winiecki added.

"Since they (MTI) installed the memory, we have had absolutely no problems," he said.

Remote Plotters Come in Sporty Models

By a CW Staff Writer

LAFAYETTE, Calif. – A good way to illustrate the operational strengths and weaknesses of remote plotters is through the analogy of race cars, according to R. D. Hanson, general manager of Zeta Research here.

The three types of plotters are analog, standard vector and differential vector, with their race car counterparts being the dragster, the sporty type and the formula ones, he added.

The analog plotter may be compared to a streamlined competitive dragster, Hanson said.

It employs absolute code, which typically requires 11 characters to generate a straight line segment in any direction. "This code allows rapid plotting of long straight lines, but short straight lines, such as those used to draw curves, are plotted slowly."

The prime advantage of the analog plotter is its very rapid speed along a straight line. "When the call is for long straight speed, the analog, like the dragster, is without peer," Hanson stated.

Once moving, the analog plotter zooms along, but it takes a long warmup period – up to 11 characters – to get going.

And like the dragster with locked steering wheel, every time the analog plotter changes direction it must repeat the 11-character warmup, regardless of the distance to be traveled.

A second disadvantage, according to Hanson, is that analog units can't travel on a long track, even if the track is straight because it makes use of reference points requiring a fixed-paper size – typical plot: 11 in. by 17 in.

The standard vector plotter employs a form of vector code, which requires only one character to generate a straight line in any of eight directions (45° angles starting at 0°).

This code allows the rapid plotting of short-line segments within the eight directions, but odd angle lines and curves are plotted very slowly, Hanson indicated.

"This plotter may be compared to a sports car with pushbutton steering," he asserted.

Its advantages are fast start – one character; sports car roadability – an incremental plotter with high accuracy and repeatability; fast directional change in any of the eight pushbutton steering directions; and good straightaway speed in any of the eight directions, he said.

The limitations of the standard vector plotter are that it lacks steering wheel maneuverability – the eight standard plotting directions; it is slow on curves and odd angles – gets progressively slower as it deviates from one of the nine directions; and it appears to "wiggle on track" – accuracy is attained by incremental steps which are visible at odd angles, Hanson said.

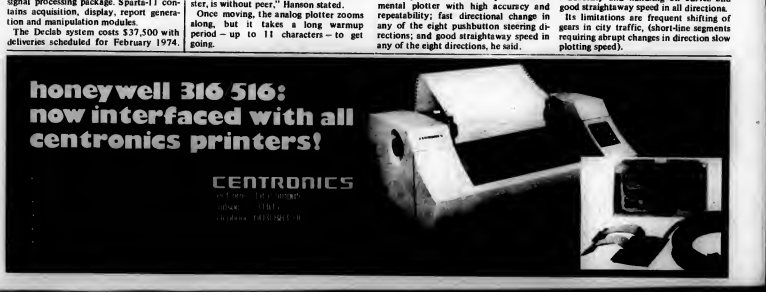
The differential vector plotter uses a form of vector code which requires only one character to generate a straight line in any direction.

This code allows the plotting of lone line segments and curves regardless of direction. But short straight-line segments with abrupt direction changes, such as those used to draw letters, are often plotted slowly, Hanson said.

These characteristics make the differential vector plotter analogous to a high-performance sports car (formula one) with power steering, he indicated.

It has a fast start (one command); good roadability and handling on curves and good straightaway speed in all directions.

Its limitations are frequent shifting of gears in city traffic, (short-line segments requiring abrupt changes in direction slow plotting speed).



How a computer company is even helping a phone company communicate better.

Honeywell is helping all kinds of companies communicate all kinds of data, faster and more economically than ever before.

Companies like Northwestern Bell Telephone of Omaha, Nebr., which uses a Honeywell computer/communications system (two Model 1250 processors and six Model 316 minicomputers) to compute the rates for long distance calls and then communicate the results as an audio response to the local operator. The system, designed to improve customer service, serves 6,000 operators in a five-state area, and is available 24-hours-per-day, seven-days-a-week.

Companies like G.D. Searle of Skokie, Ill., the manufacturer of ethical pharmaceuticals and other health care products. They're using a Honeywell 6060 computer system with a DATANET 355 front-end processor to communicate with more than 100 terminals throughout the company. Now, more people can take advantage of the computer system – laboratory scientists, order entry clerks, managers in marketing and production and finance.

Honeywell's new 7700 microprocessor-based terminal. It offers instant visual access to computer-stored data in a variety of communications environments.

Companies like De Moulas of Tewksbury, Mass., a 16-unit supermarket chain that uses a Honeywell Model 2020 computer for inventory control, store invoicing and sales analysis. Order information is transmitted from terminals in each store over phone lines direct to the computer, saving time and clerical work, and minimizing stock shortages on the shelf.

Companies like Meyer Bros. Drug, a wholesale distributor of 17,000 drug products with warehouses in Missouri, Tennessee, Alabama, Arkansas, Louisiana, Mississippi, Kansas and Oklahoma. Honeywell Model 2020 computers are located at the regional warehouses to process orders and invoices and then communicate to a central Honeywell computer at St. Louis headquarters for company-wide inventory analysis and other management reports.

Businesses like Greyhound Parks, operating seven dog race tracks and one horse track in Arizona. Greyhound uses terminals to access Honeywell's DATANETWORK time sharing service provided by a Model 6080 system in Minneapolis, Minn. Primary application is the payroll for a seasonally changing number of employees, all of which are paid through the Phoenix headquarters office.

DATANETWORK also allows Greyhound to buy only that amount of computer resources required in any one week.

Honeywell's DATANET 2000 front-end processor handles communications lines without tieing up the central processor.

And hospitals like Bernalillo County Medical Center, the University of New Mexico's teaching hospital, at Albuquerque. They've installed CRT terminals tied to a DATANET 2000 front-end communications processor, which serves a Honeywell Model 2200 computer system. The terminals are used to speed patient admission and discharge, and to record charges for hospital services.

So you can see, just about any kind or size of company or organization can benefit from Honeywell data communications. (Your computer doesn't even have to be a Honeywell system.) Now maybe you should communicate with your local Honeywell representative. Or write: Honeywell Information Systems, (MS 061), 200 Smith Street, Waltham, Massachusetts 02154.

The Other Computer Company:

Honeywell

The Third Time's a Charm

NEW YORK – It would seem that Share has a new motto – If you don't succeed at first, mail, mail again.

A Share spokesman acknowledged that two mailings of Share Proceedings had indeed been lost. The exact number of proceedings lost, rumored to be some 46,000, was not available, but "they were fully insured so there was no problem there," the spokesman said.

Information concerning the lost books was difficult to obtain because, in the words of the spokesman, "since you are with *Computerworld* we would prefer not to say anything about it."

What happened to the books? They still have not been found, but the post office is tracing them.

The only explanation Share could give was: "This was during the point in time when they were having all sorts of latter bomb scares and all kinds of things like that."

Not to be defeated, Share printed and mailed the proceedings a third time. Some of these have already been received, the spokesman said.

November Conferences Offer Diversity

Exhibits, Seminars Featured at Nerem

BOSTON – Signal processing will be broken down into five separate entities at a seminar during Nerem '73.

The seminar will be divided into five panels: digital techniques, electronic analog techniques, recent techniques, optical techniques and applications.

Nerem '73, to be held Nov. 6-8 at the Sheraton-Boston Hotel and John B. Hynes Veteran's Auditorium, will feature a diversified program of sessions, as well as exhibits.

Other seminars include display technology consisting of sessions on general-purpose displays, data entry and flat panel displays.

A session on minicomputers will look at four of the systems currently in use in everyday office environments. "The Intelligent Terminal as a Stand-Alone Computer" is one of many papers scheduled.

Further information is available from the Nerem Business Office, 31 Channing St., Newton, Mass. 02158.

Societies/ User Groups

'New Systems' Topic Of Law Conference

CHICAGO – Representatives from several jurisdictions of the criminal justice system will speak at NYU's Second National Conference on "New Systems in Law Enforcement and Criminal Justice," Nov. 7-8 at the Sheraton-Chicago.

Among those scheduled to speak are Clarence Coster, associate administrator of the Law Enforcement Assistance Administration (LEAA); Charles Work, of the Washington, D.C., U.S. Attorney's Office, and Melvin Brockleman, director of DP for the Kansas City Police Department and chief developer of the Alert ii criminal justice system.

Further information on the conference is available from Robert E. Gitelman, New York Management Center, 600 Third Ave., New York, N.Y. 10016.

Conference to Probe New DP Architecture

COLLEGE PARK, Md. – The identification and study of a new kind of computer architecture whereby the machines are designed for accepting high-level languages and/or direct-users' languages is the objective of a conference sponsored by IEEE/CS, ACM Sigplan/Sigarch and TCCA.

The conference, Nov. 7-8 at the University of Maryland, will feature a panel on high-level machine language and one on high-level language machine architecture.

Papers scheduled for presentation include "Instruction Architecture of an Aerospace Multiprocessor"; "Gloss: A High Level Machine"; and "Two Parallel Euler Run Time Model."

Registration is $32 for ACM and IEEE/CS members, $42 for others. Further information is available from Dr. Ashok Argrawala, Department of Computer Science, University of Maryland, 20742.

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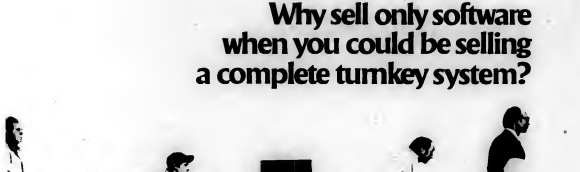

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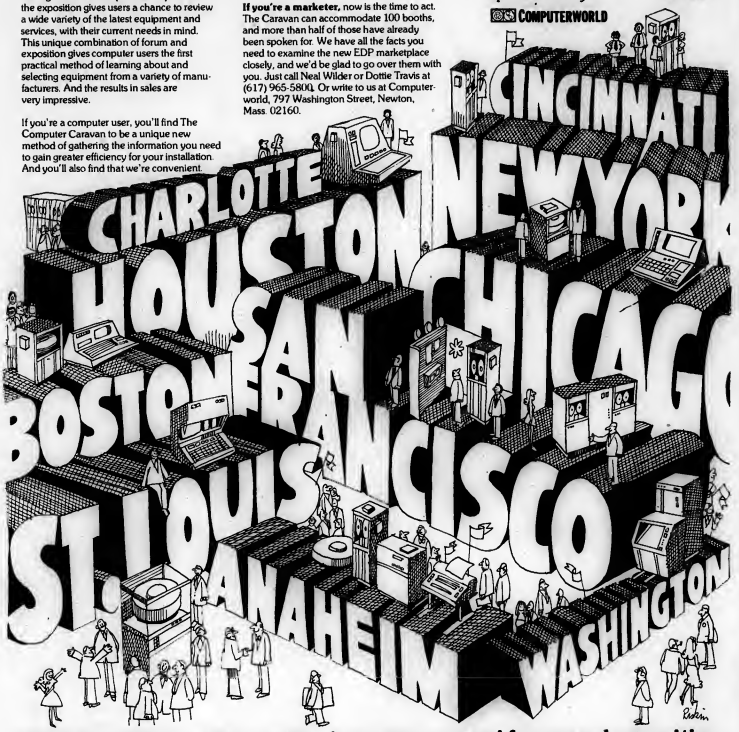

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Just Enough DP to Whet Their Appetites

By Toni Wiseman
Of the CW Staff

GRAND FORKS, N.D. – High school students here will be able to at least sample the excitement of computers thanks to a new program run by the University of North Dakota, here.

UND has established a Computer Loan Service (UND-CLS) to familiarize students with computer technology.

8 Programs

Participating high schools will receive a DEC PDP/8, which is part of the Edusystem 5 package, on loan for one month. UND-CLS provides a package of eight Basic Language programs so the students can see how the computer works before they start writing their own programs, according to UND-CLS codirector Dr. Gene Kemper.

This summer, UND-CLS ran a two-day workshop to acquaint teachers from each school with all phases of the system. Seven schools are signed up for the program this year, with the Park River High School already using the mini.

CSI, Not CAI

The program is one of computer-supplemented instruction, not computer-aided instruction, Kemper emphasized, noting the purpose is not remedial but rather innovative.

After the loan period is over, schools can continue their programming by submitting their programs to the UND Computer Center which will run the programs and return the results.

'Better Than Nothing'

"It's not a desirable arrangement," Kemper said, "but it's better than nothing."

Cost to the high school is 50 cents per month per student, with a minimum of $50 and a maximum of $200. "We hope this low fee will get schools interested and get them to lease or buy their own system," Kemper said. "We're hoping to put ourselves out of business."

Is It the Best Policy?

CHICAGO – Money may be the root of all evil, but in one case it brought to light a boy's honesty.

Bob Chisholm, 15, received a computer-written check for $583 from the Internal Revenue Service. He was supposed to get only a $5.83 refund. When he called on IRS, only perseverance enabled him to return it – he had to walk from office to office until someone gave him a receipt.

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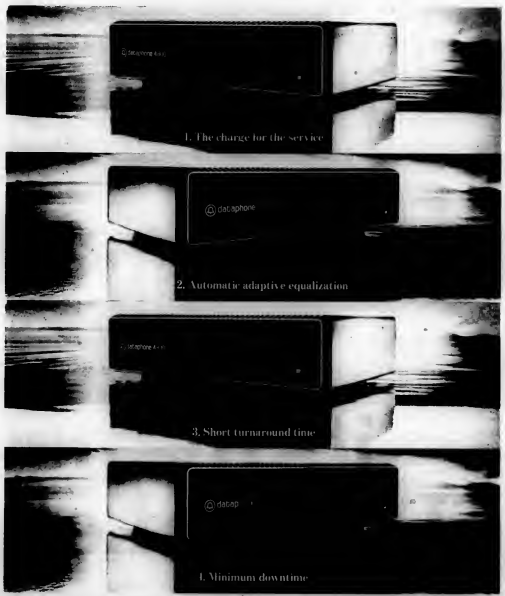

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COMPUTER INDUSTRY

CI Notes

HP to 'Reintroduce' 3000

CW West Coast Bureau

PALO ALTO, Calif. – A "reintroduction" of the Hewlett-Packard 3000 Series is slated for late this month or early November, sources said.

For the past six months, technicians have been testing the operating system for the 3000, which was introduced over a year ago, but which has undergone considerable problems on the software side, the company acknowledged.

Officials now feel the system is ready for marketing, and several end-user sites are expected to be announced.

NCSS to Aid ABC

NORWALK, Conn. – After an unfruitful attempt to merge with Tymshare, Inc., Allen-Babcock Computing, Inc. (ABC) is now negotiating with National CSS, Inc.

NCSS has agreed to provide computing services to Allen-Babcock's customers. "This agreement is expected to be superseded by NCSS's purchase of certain assets of ABC including ABC's customer list and computer programs," NCSS said.

In addition, NCSS said it is negotiating to acquire the remaining assets of ABC subject to liabilities.

Allen-Babcock recently sued Tymshare for allegedly breaching a merger contract [CW, Oct. 17].

CDC Continues Acquisitions

MINNEAPOLIS – As part of Control Data Corp.'s acquisition spree, it has picked up the U.S. data services business of International Telephone and Telegraph Corp. for an undisclosed amount of cash.

CDC also completed the acquisition of Commo Corp., which is becoming a subsidiary. CDC's Field Engineering Division will be merged into the new subsidiary, the company said.

Supershorts

Singer Co. has agreed to acquire Keane Associates, Inc.'s System/4 installed product base and marketing rights to the system in the northeastern U.S.

System/4 is manufactured by Cogar Corp.

Electronic Memories and Magnetics Corp. is integrating sales activities in the Memory Products Group into two segments, one for peripheral equipment and the other for core and semiconductor products.

Inforex, Inc. has appointed distributors in Yugoslavia, Belgium and Tsiwan, for a total of 10 distributors, as well as seven subsidiaries.

Adapso Surveys Service Bureaus – Part I

Personnel Acquisition Prime Problem

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Personnel acquisition, according to the Association of Data Processing Service Organizations, Inc.'s Seventh Annual Industry Study.

This is the first of a two-part series on the Association of Data Processing Service Organizations' Seventh Annual Industry Study. The article examines industry problems as well as improved financial reports among service bureaus.

The second article will look at trends in services demands and customer patterns.

Profitability among firms was up, and the trend toward on-line services continued to gain momentum, according to the survey, prepared by International Data Corp., here.

Limited Supply

The prime reason for difficulty in obtaining and keeping personnel, respondents said, was the limited supply of qualified people, followed by long and costly training, high turnover or lack of loyalty.

Other problems mentioned were: design, development and marketing of new products; competition or impact from service bureau alternatives and/or new technology; working capital and control of cash flow; and government regulations.

Competition, the number one problem in 1971, was rated only third in the 1972 study. Small computer systems, as an alternative to data centers, "are fast becoming a major problem," the report noted.

Respondents indicated the average intensity of competition declined in all areas, and dropped to a rating of 2.5 from 3.1 concerning other service bureaus. The rankings range from one ("no appreciable competition") to four ("highly competitive").

The average number of other service bureau competitors declined from nine in 1971 to seven in 1972.

Thirty-four percent of respondents named other service bureaus as the source of most competition, while 24% mentioned banks.

High Labor Costs

Labor costs, which fell from 53.8% of revenue in 1969 to 39.8% in 1971, rose to 44.8% and continued to be the highest expense factor as a percent of revenues.

Keypunchers comprised 25.6% of the total work force, again followed by computer operators, 12.9%; programmers, 9.3%; systems analysts/programmers (7.7%); and systems analysts, 5%.

The average weekly salary for keypunch/verify was $111; for systems, $309; programming, $246; and systems/programming, $275, according to the study.

Fifty-eight percent of the firms increased the number of employees, an increase of 4% over 1971. Only 13% of the firms reported a loss of employees, which is down 7% from 1971.

"The average number of both employees lost and employees gained declined from 1971, thereby pointing to a slowdown of employees in transition," the report said.

Thus it appears the tightness in supply of qualified help was caused by expansion rather than by job-hopping.

In 1972, there was an average net profit for service bureaus of 1.6% of revenue compared with a 6.6% of revenue loss in 1971.

The average operating profit figure increased by 0.6% over last year from 5.6% to 6.2%. The gain is actually much larger, but the report explained that under new accounting procedures expenses previously included in "other expenses" can now be allocated to named expense categories under "operating expenses."

Equipment spending continued its decline since 1971, as a percent of revenue, from 28.2% in 1971 to 24.5% in 1972.

Let's Retain Our Perspective In IBM-Telex – Impact Transitory

(This article was written before last week's developments in the IBM-Telex case.)

By Dick H. Brandon
Special to Computerworld

The judgment rendered in the Telex-IBM case is indeed a landmark. Whatever acts of invisibility IBM might have had has been inexorably destroyed, and the impact and benefits for the industry will thus be significant.

However, we are in danger of losing our perspective, if we consider that this judgment will have a significant impact on IBM, or its role or dominance in the industry.

First, the legal remedies are by no means exhausted. The Tenth Circuit Court of Appeals, or the Supreme Court, could reverse the decision, alter the amounts involved, require a retrial and/or eliminate the injunctions.

A judgment being appealed cannot be used as legal precedent.

Second, a settlement of the issues is feasible before, after or during appeal. A company in need of cash might be wise to accept a $100 million settlement as an alternative to a possible three-year wait for a net $330 million.

In addition, deferring the $21.9 million Telex payment to IBM can be done only if Telex also appeals thereby increasing its legal fees and concurrent costs, unless the court consents to a motion for a net award.

Third, even if upheld on appeal, or settled, the dollar amounts are not vitally significant to a company with annual net profits of over $1 billion, a cash reserve of $1.5 billion, and the ability to deduct part of the payment from its income taxes in any case.

Fourth, the injunctions, although significant in concept, are not really damaging. Interface specifications are not a problem, and are generally available anyway.

The Fixed Term Plan/Extended Term Plan constraints may in fact have a mild impact however, no one suggests that IBM achieved its dominance using these plans, since they are creations of the 1970s.

Unbundling of memories and control units may be helpful to the peripheral companies. As an industry their viability is in some question, however, and their ability to take advantage of this new freedom is limited except in a few selected cases.

Fifth, the impact of the judgment in the consortium case *could be* far more significant.

Aside from the fact that, the money damages to Telex are proportionately quite significant (if the IBM portion is upset on appeal, and the Telex damages are not) the injunctions against Telex are damaging:

- To return to IBM all documents containing IBM confidential information.
- To refrain from hiring any IBM employee for two years.
- To refrain from copying any IBM material.
- To refrain from using IBM proprietary information.
- To refrain from assigning former IBM employees to development or manufacture.

If these injunctions were to be applied to the peripheral industry as a whole, it would lose its principal source of information for product development – ex-IBM employees and ex-IBM material.

How else, except through licensing, can a peripheral company make a functionally comparable unit?

Certainly not using only the *interface* specification.

Thus, I believe the impact of this case to be transitory – newsworthy, but not of the impact generally ascribed in the first shock of realization.

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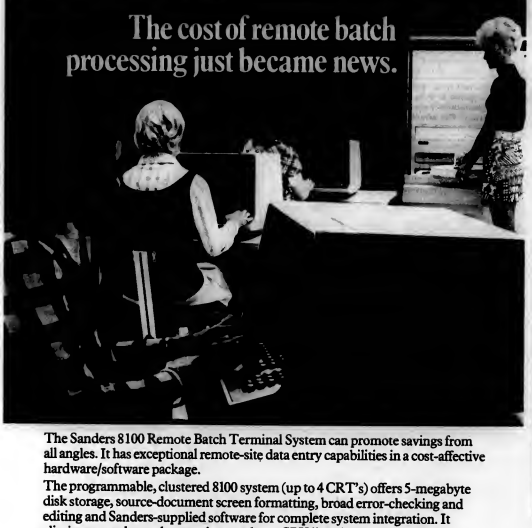

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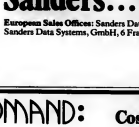

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Eastern Bloc Nations Display DP at Sicob

By M.C. Dobelis
Special to Computerworld

PARIS – The 24th annual Salon International de l'Informatique de la Communication et de l'Organization du Bureau (Sicob) held here recently attracted 579 exhibitors from 23 countries, showing over 1,500 items.

The U.S., with 185 items exhibited, was second only to West Germany, with 278 items on display. Exhibits ranged from DP equipment to office equipment and communications systems.

While the Soviet Union was absent, four Iron Curtain countries – East Germany, Bulgaria, Rumenia and Czechoslovakia – actively vied for Western trade with such products as optical character readers, punched paper tape and electronic ledger equipment, as well as typewriters and offset presses.

Minicomputers were well-represented, with 14 manufacturers present, while leasing and peripheral companies were conspicuous by their absence. There were no surprise announcements of DP products.

As in previous years, there was an eight-day DP seminar with 42 sessions, sponsored by Jean Charbonnel, the French Minister of Industrial and Scientific Development, and the French Delegation to Data Processing.

Break Up Who?

Meanwhile, Heinz Nixdorf, president of Nixdorf Computers took up the question of IBM dominance in a press conference. While not an advocate of dismantling IBM, he suggested the company be split in two: one organization for development, production, sales and maintenance; the other a financial firm handling the leasing operations.

In addition, in those countries where IBM products account for over 30% of the DP trade, he suggested the excess be taxed at higher than normal rates.

He also announced Nixdorf has acquired a minor position in Amdahl, a computer manufacturer in Sunnyvale, Calif.

M.C. Dobelis is director of systems for the Guardian Life Insurance Co. in New York.

Study Sees Market Boom In Aussie Bank Terminals

Special to Computerworld

SYDNEY, Australia – A comprehensive report commissioned by Nixdorf Computer Pty. Ltd. has estimated that terminal equipment for the Australian banking industry ordered between now and 1979 will total $100 million.

The report also indicates a strong upsurge in the banks' data processing line requirements over the next seven years.

Nixdorf's new line of terminal equipment (called Terminal 75) is designed to help the Australian branch banking situation in which some 30% of branches are remote from the major capital cities, the report said.

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Hazeltine Corporation, Greenlawn, New York will exhibit its Computer Peripheral Equipment Product Line in the 1974 Computer World Caravan. Products demonstrated will include the Hazeltine 2000 CRT Terminal, Dual Magnetic Tape Cassette Unit, Thermal and Impact Printer Units and the low cost Hazeltine 1000 CRT Terminal.

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OEM Market Seen Competitive; Key Lies in Passing on Savings

By Molly Upton
Of the CW Staff

HAYWARD, Calif. — The key to survival in the competitive OEM business is passing the savings on to the OEM buyer, Tazz A. Pettebone, disk product manager at Diablo Systems, Inc., said in a recent interview here.

Products of systems manufacturers have been having less contributive value, so peripherals costs have to go down, or the systems maker could decide to make the units himself, he said.

Diablo has been able to reduce prices on its products each year as production economies are achieved, he said.

The OEM maker is generally more mechanically, manufacturing-oriented, and can make peripherals for less than it would cost the systems makers, who are electronically oriented, he said.

Although it might look good on paper for a mainframe maker to manufacture additional peripherals, it may find its savings not as great as anticipated, he said. Peripherals are generally 70% comprised of mechanical parts.

It is known there is a shortage of ICs and other components. Pettebone said it is also difficult to procure metal castings used as the base platform of disk drives.

The disk market for minicomputers is expanding, he said, with IBM, Hewlett Packard and Digital Equipment all making disk-based systems, and endorsing the concept.

Diablo intends to stay in the mini area, rather than expand into bigger disk products, he added.

"It's the area we can best service" in terms of marketing, engineering and manufacturing, he said. He defined the market as ranging from 200M bits to 1M or 2M bits.

The floppy disk market is "extremely interesting," but the initial margin is quite low. The technology isn't unique, he added.

Expansion Plans

Diablo has been expanding, from 22,000 square feet in March 1972 to 115,000 square feet currently. The firm is preparing to move into an additional 35,000 square feet, he said.

As Diablo is a subsidiary of Xerox, its earnings do not appear separately, but the firm in the 1973 calendar year will be a $30 million company, Pettebone said. About 70% of that is from the disk drive segment of the firm, he added.

Diablo has manufacturing licensees in Japan and England, which OEM customers find not only convenient in terms of delivery, but also economical, he said.

The licensees' products are not subject to import and export duties, he said. In addition, the licensees offer support.

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Exchange Installs Odd-Lot System

NEW YORK – The New York Stock Exchange has completed the installation of its odd-lot automation system.

Odd-lots are trades consisting of less than 100 shares and make up 35% of all transactions at the exchange.

The exchange uses Data Trends, Inc. terminals on the floor and a 360/50 for odd-lot switching. All odd-lot order information is transmitted to Carlisle-Decoppet, the Big Board's principal odd-lot dealer, according to Charles Storer of the exchange.

Carlisle-Decoppet uses Digital Equipment PDP-11s to process the orders.

In addition to providing an electronic link between the retail brokers, the exchange and the odd-lot dealer, the automation system captures all information needed for clearance and settlement of odd-lot trades, according to James J. Needham, exchange chairman.

Contracts

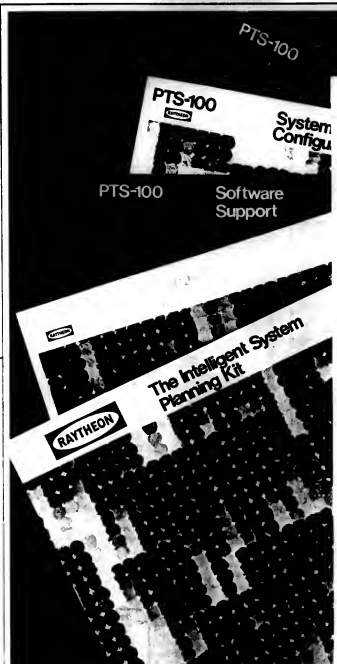
Dier Computer Corp. has been awarded a contract by the Australian Government's Department of Health to supply 26K of monolithic main memory, control units and 18 disks for use on the department's two 360/65 computers.

Raytheon Data Systems has received a contract from Trans World Airlines to supply PTS-100 programmable terminals, data processors and ticket printers for reservations and ticketing services at six airports and at TWA's corporate headquarters in New York City.

On-Line Software, Inc. has been awarded a contract by the Canadian Department of National Revenue Taxation for software development and hardware planning for its on-line Rapid inquiry system.

Communications Control Centers, Inc. has been awarded a contract by New Castle County, Delaware, to design and install a computer system to assist in the dispatching and monitoring of fire, ambulance and rescue units.

American Videonetics has been awarded a contract by CBS Laboratories to supply tape cartridge memory units to form the primary peripheral bulk storage memory for CBS Vidifont titling systems.



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In Europe: Raytheon Data Sales, Spaklerweg 53, Amsterdam, Netherlands. Tel. 020-93-0787. In England: A.C. Cosser Ltd., The Pinnacles, Elizabeth Way, Harlow, Essex, Harlow 26662.

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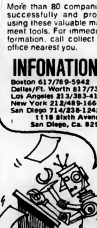

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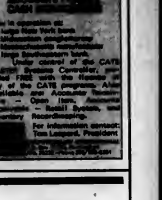

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Rental Revenues Rise

IBM Notches Record Quarter, Nine Months

ARMONK, N.Y. – IBM revealed a record-setting quarter and nine months ended Sept. 30, with earnings rising 28% and revenue jumping 18% in the three-month period.

Revenues from rentals and services in the nine months rose 14.2% above the year-before figure, continuing the improving trend. In the first quarter the gain over the year before was 11.3%, and through the first half, a 12.3% increase.

In 1972, IBM posted a 9.2% increase in rentals and services revenue.

Outright sales of DP equipment in the nine months were lower than in the previous year's period, Chairman of the Board and President Frank Cary said.

However, shipments are "accelerating" and sales in the third quarter were higher than in the 1972 period, he added.

In the third quarter, the ratio of outright sales to rentals was higher than the year-before period, a spokesman noted.

In the quarter, earnings soared to $409.9 million or $2.81 a share from $320.9 million or $2.21 a share a year before, adjusted to reflect a five-for-four stock split in May 1973. Revenue increased to $2.76 billion from $2.33 billion.

Nine-month earnings reached a record $1.11 billion or $7.59 a share, up nearly 18% from $938.8 million or $6.48 a share in the same 1972 period.

Mainframer Delight

The quarter ended Sept. 30 looks like a banner one for firms in the mainframe business, if three reports are any indication.

IBM and Burroughs each reported records in the quarter and nine months, and Control Data Corp.'s DP operations climbed substantially to help offset declining earnings from Commercial Credit Corp.

Revenue rose nearly 11% to a record $7.75 billion from $7.01 billion in 1972.

Cary said IBM didn't make any provision in the financial results for any damage payment to Telex because it expects any amounts that "may ultimately become payable would be reported as a restatement of the earnings of the applicable prior years."

Burroughs Quarter Earnings Rise 30%; Nine-Month Net Jumps 35%

DETROIT – Record revenues and earnings were the story at Burroughs Corp., with worldwide orders for the nine-month period increasing 24% above those in the same period last year.

In the quarter, earnings rose 30% and revenues 21% over those of the previous year's quarter. Earnings totaled $21.2 million or $1.09 a share compared with $16.4 million or 88 cents a share in the 1972 third quarter.

Revenues jumped to nearly $303 million compared with $250.1 million a year ago.

In the nine months, earnings rose 35% to $66.2 million or $3.44 a share compared with $48.9 million or $2.63 a share a year ago.

Revenues advanced 24% to $895.3 million from $722.7 million in the same 1972 period.

Worldwide backlog reached record levels, showing a 34% increase since the beginning of the year, President Ray W. MacDonald said.

CDC Operations Improve Markedly In 9 Months, 3d Period Down

MINNEAPOLIS – Results from Control Data Corp.'s computer operations increased sharply in the quarter and nine months ended Sept. 30, but the firm, saddled with high interest rates in its financial subsidiary, displayed lower earnings in the third quarter compared with the year-ago period.

Nine-month figures, however, exceeded those of the 1972 period.

Orders for CDC's computer business are expected to exceed goals set earlier this year, according to Chairman William C. Norris.

Quarterly earnings from computer operations reached $3.5 million compared with $2.6 million a year ago. Revenues totaled $229.1 million compared with $170.8 million last year.

In the nine months, earnings from the DP sector climbed to $13.2 million from $2.1 million a year ago. Total corporate revenues rose to $661.2 million from $466.5 million.

SBC Factor

The firm said if the acquisition of Service Bureau Corp. had occurred in 1972 on the same date and basis, earnings for the third quarter and nine months of 1972 would have been increased by $1.4 million and nearly $5 million, respectively.

The firm's overall earnings for the quarter declined to $13.2 million or 81 cents a share compared with $16.2 million or $1.05 a share in 1972.

In the nine months, earnings totaled $45.7 million or $2.80 a share compared with $43.8 million or $2.88 a share in the same 1972 period.

Earnings of Commercial Credit Co., the firm's financial subsidiary, fell to $10 million in the quarter compared with $13.8 million a year ago.

Acquisitions

Microdata Corp. has acquired Telogic Systems, Inc., developer and manufacturer of computer-based telephone monitoring systems.

Graphidyne Corp. has reached an agreement to acquire Comtrol, Inc., in exchange for 283,600 shares of Graphidyne's common stock, subject to approval of the agreement by Comtrol shareholders and registration of the shares with the Securities and Exchange Commission.

Econocom, Inc., Memphis, Tenn., has purchased the computer leasing subsidiary, Hidoc International, Inc., from Graphic Sciences, Inc. for about $3 million.

Advanced Computer Techniques Corp. has agreed in principle to acquire Creative Socio-Medics Corp., which provides DP services to health care institutions.

Kappa Systems, Inc. has agreed in principle to acquire Control Systems Research, Inc. Both firms provide systems analysis.

Informatics, Inc. has acquired Knowledge Networks, Inc. for an undisclosed amount of cash.

Data Systems Analysts, Inc. (DSA) has agreed in principle to acquire certain Cybermatics, Inc. software assets in exchange for 175,000 shares of DSA common stock. Consummation of the transaction will make Cybermatics the largest single stockholder of DSA.

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Earnings Reports

OPF
Three Months Ended Aug. 31

	1973	1972
Shr Erng	$.04	.....
Revenue	7,724,000	$8,927,000
Spec Cred	¢206,000	20,000
Earnings	155,000	20,000

e-Income from repurchase of debentures.

COMPUTER TASK GROUP
Six Months Ended June 30

	1973	1972
Shr Erng	$.09	$(.01)
Revenue	1,663,132	967,182
Earnings	70,154	(5,814)

COMPUSCAN
Three Months Ended Aug. 31

	1973	1972
Shr Erng	$.11	$.07
Revenue	1,628,000	1,045,000
Tax Cred	76,000	42,000
Earnings	171,000	107,000

NATIONAL INFORMATION SERVICES
Six Months Ended June 30

	1973	1972
Shr Erng	$.10	$.16
Revenue	782,812	657,129
Tax Cred	20,884	21,300
Earnings	50,280	51,297

INTERNATIONAL TIMESHARING
Three Months Ended Aug. 31

	1973	1972
Shr Erng	$.06	$(.05)
Revenue	1,362,052	922,833
Earnings	110,753	(97,931)

NUCLEAR DATA
Three Months Ended Aug. 31

	1973	1972
Shr Erng	$.26	.....
Revenue	4,703,369	$2,765,744
Tax Cred	90,000	.....
Earnings	301,215	(750,976)
6 Mo Shr	.47	.26
6 Mo Revenue	9,388,364	5,853,437
Tax Cred	130,000	.....
Earnings	520,075	(1,343,578)

ENNIS BUSINESS FORMS
Three Months Ended Aug. 31

	1973	1972
Shr Erng	$.28	$.13
Revenue	12,152,153	10,228,035
Earnings	666,565	322,227
6 Mo Shr	.47	.26
Revenue	23,662,563	20,174,721
Earnings	1,117,569	643,015

NATIONAL DATA
Three Months Ended Aug. 31

	1973	a1972
Shr Erng	$.09	$.09
Revenue	8,136,098	3,216,444
Earnings	474,455	460,275

e-Restated.

REDACTRON
Year Ended June 30

	1973	1972
Shr Erng	$.48	$(6.32)
Revenue	11,455,262	1,862,951
Tax Cred	240,000	.....
Earnings	502,428	(2,517,453)

MSI DATA
Three Months Ended June 30

	1973	1972
Shr Erng	$.11	$.05
Revenue	4,173,880	2,964,436
Earnings	212,415	88,516

BALTIMORE BUSINESS FORMS
Three Months Ended June 30

	1973	1972
Shr Erng	$.16	$.12
Revenue	4,581,000	4,617,000
Earnings	131,000	96,000
6 Mo Shr	.41	.28
Revenue	9,666,000	9,196,000
eSpec Cred	.....	23,000
Earnings	300,000	215,000

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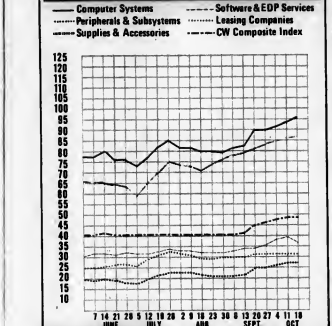

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADEQUOTES, INC. Cambridge, Mass. 02139

		PRICE		WEEK	WEEK
		1973	CLOSE	WEEK	WEEK
		RANGE	(1)	CHNGE	CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	211-245	232	+8 1/4	+3.8
N	COLLINS RADIO	18- 24	24 5/8	0	0.0
N	COMPUTER AUTOMATION	14- 19	20 1/4	+1 1/8	+5.9
N	CONTROL DATA CORP	31- 42	40 3/4	+1 1/8	+2.8
N	DATA GENERAL CORP	40- 46	46 1/2	+2 3/4	+6.2
N	DATAPOINT CORP	14- 21	18 7/8	+1 3/8	+7.8
N	DIGITAL COMP CONTROL	2- 4	3	0	0.0
N	DIGITAL EQUIPMENT	73-104	104	+8 1/8	+8.1
N	ELECTRONIC ASSOC.	4- 6	5 3/4	+1/2	+9.5
A	ELECTRONIC ENGINEER.	4- 16	13	+1 1/2	+13.0
N	FOXBORO	23- 35	34 1/8	+2 1/8	+6.6
O	GENERAL AUTOMATION	22- 34	42 1/2	+2	+10.3
O	GPE COMPUTER CORP	1- 2	1 1/2	1/8	-7.7
N	HEWLETT-PACKARD CO	73- 96	111 1/8	+3 3/8	+3.1
N	HONEYWELL INC	103-139	139 1/4	+1	+0.7
N	IBM	270-305	283 1/4	+4 3/4	+1.7
N	INTERDATA INC	3- 4	3 1/2	1/4	+7.7
N	MICRODATA CORP	2- 3	3 5/8	+1/4	+7.4
N	NCR	27- 44	44 3/8	+3 1/8	+7.5
N	RAYTHEON CO	29- 34	34	+1 1/8	+3.4
N	SINGER CO	45- 74	58 1/2	-1 7/8	-3.2
N	SPERRY RAND	36- 54	52 7/8	+ 1/4	+0.4
N	SYSTEMS ENG. LABS	3- 4	3 3/4	+ 1/4	+7.1
N	TEXAS INSTRUMENTS	83-139	130 1/4	+ 1/4	+0.5
N	UNIVAC SYSTEMS INC	9- 11	9 7/8	- 1/4	-10.5
N	VARIAN ASSOCIATES	18- 20	18	0	0.0
N	WANG LABS	11- 16	15 3/4	+3 5/8	+10.1
N	XEROX CORP	130-160	144 1/2	+2 7/8	+2.0
	LEASING COMPANIES				
A	BOOTHE COMPUTER	8- 8	8 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMPUTER INVESTORS	2- 3	2 1/8	- 1/8	-5.6
O	COMMERCE GROUP CORP	3- 4	3 5/8	+ 1/8	+3.5
O	COMPUTER EXCHANGE	1- 1	1	0	0.0
A	COMPUTER INVSTRS GRP	2- 3	3 1/4	0	0.0
O	COMP. INSTALLATIONS	1- 1	1	0	0.0
N	DATRONIC RENTAL	2- 3	2	- 1/4	-11.1
A	DPL INC	3- 3	3	- 1/4	-7.7
A	DEARBORN-STORM	12- 24	18 5/8	+ 1/8	+0.6
O	DPF INC	5- 8	7 1/4	0	0.0
A	ECN RESOURCES	1- 3	1 3/4	0	0.0
O	ELECTRONIC INT.	1- 2	1 1/2	0	0.0
A	GREENWOOD COMPUTER	5- 8	7 1/4	+ 1/4	+3.6
A	ITEL	4- 12	8 3/4	+1 1/8	+20.7
N	LEASCO CORP	14- 19	17 1/2	+ 1/2	+2.9
O	LFE&PAC CORP	1- 4	1 5/8	+ 3/8	+30.0
O	LEVITRO MAT INC	1- 2	1 1/2	0	0.0
O	NRG INC	5- 15	5 1/4	- 1	-16.0
A	PIONEER TEX CORP	5- 7	6	+ 1/4	+4.3
A	ROCKWOOD COMPUTER	1- 3	1 1/4	0	0.0
N	U.S. LEASING	18- 36	23 1/4	+1 3/4	+7.8

EXCH: SHARE TOPIC: A=AMERICAN PAMPH=BALT-HAIR
L=NATIONAL N=NYSE O=OVER-THE-COUNTER
N-T-C PRICES ARE BID PRICES AS OF 3 P.M. ON LAST BID
(1) TO NEAREST DOLLAR

		PRICE		WEEK	WEEK
		1973	CLOSE	WEEK	WEEK
		RANGE	OCT 17	NET	PCT
N		(1)	1973	CHNGE	CHNGE
O	COMPUTER COMMUN.	1- 1	1	+ 1/8	+14.2
A	COMPUTER EQUIPMENT	2- 3	2 3/8	+ 1/8	+11.7
A	COMPUTER MACHINERY	1- 1	1	0	0.0
O	COMPUTER TRANSCEIVER	1- 1	1 1/2	0	0.0
N	CONRAC CORP	14- 32	32 3/4	+1 1/2	+4.7
A	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
A	DATA 100	14- 17	17	+3 3/4	+4.6
A	DATA PRODUCTS CORP	2- 4	3 1/2	- 1/8	-3.4
A	DATA RESOURCES	1- 2	1 1/2	0	0.0
A	DATA TERMINAL SYS	1- 1	1	0	0.0
O	DECISION DATA COMPUT	8- 11	12 3/4	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1	0	0.0
O	DIZAN CONTROLS	1- 4	2 3/4	+ 1/4	+9.3
O	ELECTRONIC N & M	5- 8	5 1/2	+ 1/4	+4.8
O	FARRI-TEK	2- 5	3 3/4	- 1/8	-3.1
O	GENERAL COMPUTER SYS	2- 5	3 1/4	+ 3/4	+30.0
N	GENERAL ELECTRIC	58- 76	65 1/2	-1	-1.4
N	HAZELTINE CORP	9- 15	9 3/4	+1 1/8	+13.0
O	INFODATA INC	5- 23	5 3/4	+ 1/8	+9.8
O	INFORMATION DISPLAYS	1- 2	3/4	0	0.0
A	INFORMATION INTL INC	1- 2	1	0	0.0
A	LINDY ELECTRONICS	1- 3	2	0	0.0
A	MANAGEMENT ASSIST	1- 1	1	0	0.0
A	MDS INC	1- 2	1 1/2	0	0.0
A	MILGO ELECTRONICS	14- 26	25 1/8	+ 1/4	+1.0
O	MINIMAX DATA REG	1- 2	1 1/2	+ 1/8	+8.3
O	OMEC COMPUTER SYST.	2- 6	4 1/8	+1 1/8	+37.5
O	OPTICAL SCANNING	2- 4	3 1/4	+ 1/4	+8.3
O	PENTEC CORP	1- 2	1 5/8	+ 1/8	+8.3
O	PHOTRON	1- 3	2	0	0.0
A	POTTER INSTRUMENT	3- 9	5 3/4	+ 5/8	+12.1
A	PRECISION INST.	1- 2	1 1/2	0	0.0
O	QUANTUM CORP	5- 11	5 1/4	- 1/2	-8.7
O	RFC&MOTION EQUIP	3- 8	3 1/4	- 1/4	-7.1
N	SANDERS ASSOCIATES	9- 18	11 1/2	+ 1/2	+4.5
O	SCAN DATA	1- 2	1 1/2	0	0.0
O	STORAGE TECHNOLOGY	11- 20	19 1/2	+ 1/2	+2.6
O	STOCK ID SYS	13- 20	13 1/2	+ 1/4	+1.3
O	TALLY CORP.	1- 2	1	0	0.0
A	TEC INC	8- 9	9	-1	-11.1
N	TEKTRONIX INC	39- 94	92 1/4	-1	0.0
A	TELEX	2- 4	3 3/4	+ 1/4	+7.1
O	TERADYNE INC	7- 13	13 1/4	+ 1/2	+3.9
O	WILTEK INC	3- 5	3 1/4	+ 1/4	+12.5
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 8	5 3/4	0	0.0
A	BARRY WRIGHT	1- 2	1 1/2	0	0.0
A	DATA DOCUMENTS	13- 24	24	+1 1/4	+5.5
O	DUPLEX PRODUCTS INC	1- 2	1 1/2	0	0.0
O	ENNIS BUS FORMS	8- 14	13 1/2	+ 1/2	+3.8
O	GRAHAM MAGNETICS	2- 20	2 1/8	+ 1/8	+6.2
O	GRAPHIC CONTROLS	8- 12	9 5/8	+ 3/8	+4.0
N	IP COMPANY	24- 41	29 1/2	+ 3 1/8	+3.8
O	MOORE COMP LTD	43- 88	58 3/4	+ 1/4	+0.4
N	NASHUA CORP	13- 20	14 3/4	+ 1/4	+1.7
O	REYNOLDS & REYNOLD	49- 51	43 1/4	-2	-4.4
O	SCIENTIFIC COMPUTER	1- 2	1 1/2	0	0.0
O	TAB PRODUCTS CO	8- 11	11 7/8	0	0.0
O	UNISYS	1- 2	1 1/2	0	0.0
A	WABASH MAGNETICS	5- 8	7 1/4	- 1/4	-3.3
N	WALLACE BUS FORMS	15- 24	20 1/2	- 3/4	-3.5

We would suggest you compare the Hazeltine 1000 with other teletypewriter-compatible CRT Terminals at its price* ...if there were any.

The Hazeltine 1000 Terminal features a 960-character display (80x12), your choice of transmission speeds up to 9600 bps as well as parity generation and checking. Options include upper/lower case, answerback and an auxiliary EIA output. All at a price that fits easily into your budget.

And of course you get the unmatched performance and reliability you've come to expect of every product bearing the Hazeltine name. For an on-site demonstration, call your Hazeltine representative.

Hazeltine 1000

* $49 mo.

12-month rental, maintenance included.

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